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Моделирование академической статьина английском языке через анализоригинальных химических текстов

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Моделирование академической статьи на английском языке через анализ оригинальных химических текстов

Учебное пособие

Допущено УМО по классическому университетскому образованию в качестве учебного пособия для студентов, обучающихся по направлению подготовки 040000 - Химия

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Учебное пособие систематизирует материалы, посвященные анализу оригинальных англоязычных источниковхимической направленности и знакомству с основами академического письма. В нем рассматриваются основные структурные компоненты научной статьи, приводится алгоритм аналитического чтения и подробного пересказа извлеченной информации, прививается навык написания собственной исследовательской статьи на английском языке. Материал представлен в виде таблиц и вопросников. Для облегчения построения устного высказывания и составления своего письменного варианта научной статьи пособие сопровождается списком клишированных фраз как для устной, так и письменной речи.

Предназначено для аудиторной и самостоятельной работы магистрантов и аспирантов (направление 020100 «*Химия*»), но также может применяться во время практических занятий.

Печатается по решению редакционно-издательского совета Ивановского государственного химико-технологического университета.

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ПРЕДИСЛОВИЕ

Авторский курс по академическому чтению и письму разработан для магистрантов и аспирантов, обучающихся по направлению 020100 «*Химия*», чтобы привлечь внимание к англоязычным академическим источникамв качестве издательской базы для публикации собственных исследовательских результатов с целью повышения их значимости и весомости в мировом научном сообществе. Данный модульпредлагает слушателям алгоритмчтения и анализа оригинальных статей, а такжезнакомит с основами академического письма.

Приоритетной задачей курса является формирование элементарных навыков поиска и отбора информации, устойчивых навыков анализа структуры оригинальных научных статей, совершенствование приобретенных умений обобщения и изложения полученной информации на английском языке, составление сопоставительных пересказов нескольких источников, развитие стабильных навыков написания научных статей по результатам собственных исследований. Главным итогом освоения данного курса является активное вовлечение слушателей в групповое обсуждение проанализированных оригинальных научных источников и составление подробного отчета на английском языке в виде научной статьи или реферата.

На первых(вводных) занятияхданного модуля рекомендуется совместное рассмотрение и анализ типичных по структуре научных публикаций. Внимательное пошаговое прорабатываниепредложенной преподавателем статьипозволяет слушателям овладетьрабочим алгоритмом грамотного разборалюбого академического источника. В начале курса первоочередное внимание следует уделить знакомству с заглавием, в котором сосредоточены преимущественно ключевые термины, затем рекомендуется изучить аннотацию к статье, а такжесконцентрироваться на иллюстративных материалах и основных заключительныхвыводах ученых. В финалегруппового ознакомительного чтения публикации необходимо выработать и сформулироватьединый рабочий алгоритм анализа текста таким образом, чтобы каждый из присутствующих на занятии дополнил итоговые выводы собственнымирассуждениями.

После систематизации и обобщения механизма чтения академического источника можнообращаться к детальномурассмотрению самостоятельных структурных части академической статьи. Следует отметить, что для каждого конкретного раздела (*Introduction*, *Experimental*, *Resultsanddiscussion*, *Conclusion*) следует также совместными усилиями вычленить характерный алгоритм его построения, выделить основные

составляющие элементы. Рекомендуется из каждой части оригинального источника обязательно накопительным образом выписывать обнаруженные в тексте клише, типичные грамматические конструкции, интересные и нужные речевые обороты письменной речи. Кроме этого, студентов необходимо обеспечить минимальным набором клишированных фраз для устной передачи извлеченной при чтении информации. Параллельно целесообразнообращать внимание слушателей на связь национального менталитета и специфики написания анализируемой работы. Заключительные занятия можно посвятить нахождению и коррекции разнообразных ошибок, допущенных при изложении собственных результатов научных исследований во время написания подобных рабочих отчетов аспирантами предшествующих лет обучения.

В результате освоения данного курса на основе современной компетентностно-личностной концепции образования у слушателей формируются и совершенствуются следующие компетенции:

- способность к восприятию, анализу, обобщению и систематизации извлеченной информации;
- развитое критическое мышление;
- способность логично, четко, аргументированно и грамотно выражать собственные мысли на иностранном языке в устной и письменной речи;
- продвинутые навыки поиска и практического восприятия необходимой профессиональной информации;
- выработанные навыки публичной речи и участия в дискуссии и полемике на иностранном языке;
- умения качественно и эффективно управлять своей научной и публикационной карьерой.

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РАЗДЕЛ 1. СТРУКТУРА ТИПИЧНОЙНАУЧНОЙ СТАТЬИ

Researchisformalizedcuriosity.
It is poking and prying with a purpose.
ZoraNealeHurston (1891-1960)

Работа с зарубежными источниками специальной направленности является в настоящее время неизбежным компонентом научно-исследовательской деятельности, так как научная литература, с одной стороны,обеспечивает надежное хранение и распространениеобъективного знания, ас другой,выступает естественным и необходимым механизмомпрофессиональной коммуникации среди ученых всего мира.Именно это информационно-исследовательское пространство обслуживает научный речевой стиль, в основные функции которого входят закреплениерезультатов процесса познания и хранениеполученных сведений (так называемая эпистимическая функция); получение нового багажа знаний (когнитивная функция), а также передача специальной информации (коммуникативная функция) [1]. Следует отметить, что в рамках научного стиля выделяют академический и научно-популярный подстили, причем первый рассчитан на подготовленного в научном плане адресата, а второй, как правило, – на непрофессионала.

Самым желанным и главным итогом работы любого ученого является весомая публикация в авторитетном научном журнале; она же оказывается наиболее распространенным жанром научного

функционального стиля.Это оригинальное произведение исследовательского характера небольшого размера. Сдавая в печать свой материал, автор преследует определенную цель – познакомить широкие научныекруги с результатами собственных изысканий, их интерпретацией и выводами, что способствует последовательному выявлению приоритетапри решении исследовательских задач в обозначенной области. Научный текст отражает работу разума и адресован разуму, следовательно, он должен удовлетворять требованиям логического построения и максимальной объективности изложения.

Тексты подобного жанра обладают свойствами, присущими любому научному тексту, и должны строго соответствовать требованиям, предъявляемым к научной статье.Основные качества научного стиля характеризуются подчеркнутой логичностью, смысловой точностью и однозначностью выражения мысли, информативной насыщенностью, объективностью изложения, использованиемтерминологической лексики.Спецификаязыкового оформления научных текстов подчиненаконкретному стандарту, который предписывает для данных условий коммуникации клишированный вариант научного подъязыка.К синтаксическим особенностям относятся усложненные грамматические конструкции с сочинением и подчинением, отягощенные к тому же различными обособленными оборотами. Лексический аспект находит свое выражение в насыщенности текста статьи узкоспециальными и общенаучными терминами [1].

Для того чтобы получить первоначальное, достаточно общее впечатление о статье, необходимо провести операцию, подобную сканированию (*skimming*). Познакомившись с названием написанной научной работы, ее автором или коллективом ученых, местом и годом издания, ориентируясь по ключевым словам, легко определить, есть ли

смысл продолжать чтение. Если ключевые слова совпадают с вашими научными интересами, смело можно бросать беглый взор на приводимые иллюстрации, которые в силу своей наглядности позволят сделать предварительные выводы о проведенном исследовании. Обращение вслед за этим к аннотации убедит вас в правильности сделанного выбора. И только после этого можно со всем вниманием погружаться в подробное чтение отобранной статьи.

Обратимся к подробному рассмотрению формата научной статьи, так как здесь имеются свои особенности и тонкости. Важно иметь четкое представление о том, что следует включать в текст научной статьи. Традиции описания исследовательских результатов универсальны, хотя иногда их диктует конкретное печатное издание. Основные компоненты любого письменного научного труда строятся по определенному стандарту и отражают следующие обязательные разделы и детали: аннотация, введение, материалы и методы, результаты, обсуждения, выводы, таблицы и рисунки, цитаты, список использованной литературы.Любые дополнительные элементы оформления работы делают ее более информативной и понятной читателю.

Рассмотрим вкратце композиционные звенья научной статьи и основное содержание каждой части.

Аннотация (*Abstract*). Составляет тематическое ядро совместно с заголовком, причем заголовок направляет внимание адресата на перспективное изложение основной идеи. Аннотация – это лаконичное, предельно сжатое (как правило, объемом в один параграф) изложение всей статьи; авторский концепт, поэтапно раскрывающийся в последующем тексте [2]. В ней кратко формулируется рассматриваемая проблема, упоминаются методы исследования, применяемые для изучения этого вопроса, а также полученные результаты и выводы.Прочитав аннотацию,

легко определить основные положения научного труда. Хотя именно с нее начинается любая статья, составляют аннотацию в самый последний момент, по завершении изложения всего материала.

Введение (*Introduction*). Служит своеобразным мостиком от постановки общей научной проблемы к определению частной задачи. Здесь, как правило, четко формулируется рассматриваемый вопрос; объясняется, почему он важен и кому интересен; разъясняется предпринятый в исследовании подход таким образом, чтобы потенциальному читателю сразу было понятно, что и почему предпринималось.

Материалыиметоды (*Materials and Methods*). В данном разделе кратко описывается процедура проведенного исследования. Сюда следует включить описание изученных материалов и используемых с этой целью методик, так чтобы любой эксперимент был понятен и прост в повторении. Воспроизводимость приведенных экспериментальных условий является непреложным требованием, отличающим научное исследование. Следует предоставить информацию об ограничениях и допущениях относительно использованных методов. Вся необходимая релевантная экспериментальная информация приводится в этой части. Если статья предназначена для узкоспециализированного издания или описываются хорошо известные методы, можно ограничиться ссылкой на литературу, в которой имеется полное описание методик. В противном случае методологический раздел должен быть изложен как можно более подробно.

Результаты (*Results*). Раздел обобщает основные результаты, полученные в ходе проведенного исследования. Каждый параграф открывается вводным предложением, раскрывающим суть описываемого явления. Любой приводимый результат обязательно иллюстрируется

разнообразными данными в виде рисунков и таблиц, чтобы потенциальный читатель смог оценить проведенные эксперименты. Однако также непременно должно присутствовать соответствующее текстовое сопровождение.

Таблицы и ***рисунки*** (*tablesandfigures*) логично вписываются в контекст письменного изложения. Формат их построения должен быть легким для восприятия и толкования, так чтобы суть наглядных материалов вычленялась без особых усилий, и не требовалось дополнительного обращения к тексту. Именно благодаря грамотному вкраплению в текст табличных данных можно судить о воспроизводимости или статистической значимости полученных параметров. Однако при включении разных типов иллюстраций в текст не следует располагать их в отрыве от соответствующих разъяснений. Размещать рисунки и таблицы следует по центру страницы. Таблицы последовательно нумеруются, каждая под собственным названием, указываемым над ними. Рисунки также сопровождаются сквозной нумерацией с подписью под ними. Таблицы и рисунки могут также печататься на отдельных листах и выступать в качестве приложения.

Обсуждение (*Discussion*). Поскольку в этой части статьи приводятся рассуждения по поводу основных полученных результатов, здесь следует интерпретировать и объяснять приводимые выше данные. Чаще всегоэтот раздел объединяется с представлением результатов, однако независимо от структуры статьи, обсуждение результатов должно присутствовать обязательно. Здесь следует указать особенности работы, а также оценить рамки, в которых применимы выводы, сделанные по результатам исследования, поскольку каждая методика проведения эксперимента налагает свои ограничения на то, насколько широко можно трактовать полученные данные. Кроме этого, важно провести сравнение

представленных в статье результатов с проведенными ранее исследованиями, как собственными, так и других авторов. Это позволит наглядно показать новизну и преимущества выполненной работы относительно предшествующих исследований. Можно отметить, насколько ожидаемыми и прогнозируемыми оказались ваши результаты и указать на перспективы применения.

Выводы (*Conclusion*). В завершении статьи формулируются**выводы**, приводится информация о вкладе проведенного исследования в науку, полученные результатысопоставляются с заявленной во введении целью. Важно определить значение работы для будущих исследований, спрогнозировав его перспективное направление. Следует помнить, что отрицательного результата в науке не бывает, поскольку любое исследование есть проверка определенной гипотезы. Вполне нормально, что некоторые гипотезы не находят своего подтверждения. Чем раньше ученый признает свою ошибку, тем меньше его времени будет потрачено на последующие бесплодные исследования. Более того, публикация негативного результата даст возможность другим ученым избежать ненужных затрат на работу в заведомо тупиковом направлении.

Список использованной литературы (*Referencelist*). Данный раздел объединяет в себе все цитированные в научной статье работы других ученых. При оформлении списка рекомендуется строго следовать принятому стандарту.

Благодарности (*Acknowledgment*). Факультативный раздел, в котором упоминаются фонды, спонсоры и прочие участники и источники, способствовавшие появлению научного труда.

Таким образом, структура научной статьи может быть представлена в следующем виде.

Таблица 1.

Структурные компоненты статьи

Аннотация (***Abstract***)	Краткая информация о том, что было сделано; основные выводы
Введение (***Introduction***)	Рассматриваемая проблема в общем виде; связь с научными и практическими задачами; анализ последних достижений и публикаций по проблеме; характеристика нерешенной проблемы; цели и задачи
Экспериментальная часть (***Materials and methods***)	Основные принципы и подходы к решению указанной проблемы
Результаты (***Results***)	Что при этом было выявлено или обнаружено
Обсуждение (***Discussion***)	Объяснение выявленных и обнаруженных явлений и фактов
Заключение (***Conclusion***)	Существенные выводы из проведенного исследования и перспективы в данном направлении
Благодарности (***Acknowledgment***)	Кто оказывал помощь при затруднениях
Список использованной литературы (***Referencelist***)	На какие работы приводятся ссылки
Приложения (***Appendices***)	Дополнительная информация

ВОПРОСЫ И ЗАДАНИЯ

1. Понятие «академическое письмо» объединяет в себе различные классические образцы письменной речи: сообщения (*reports*), эссе (*essay*), отчеты (*assignments*), задания исследовательского характера, связанные с конкретной областью научных знаний (*projects*), предписания и инструкции (*instructions*), курсовые работы, доклады, статьи, диссертации (*papers*).Совпадают ли структурные особенности написания данных письменных работ? Какова специфика каждого образца?

2. Назовите особенности академического стиля письма.

3. В чем состоят существенные различия между академическим и научно-популярным стилями?

4. Распределите названия популярных зарубежных журналов на две категории. Для какой из них характерен академический стиль? Приведите аргументы.

Age and Ageing
American Demographics
American Journal of Public Health
American Naturalist
American Scientist Magazine
Amino Acids
Analytical Chemistry
Annals of the New York Academy of Sciences
Current Science
European Journal of Histochemistry
Experimental Brain Research
Fluoride
Food Chemistry
Men's Health
National Geographic Magazine
Nature
Pollution Research
Popular Science Magazine
Science Illustrated Magazine
Science News Magazine
Scientific American Magazine

The New Yorker

5. Какая информация может содержаться в каждом из перечисленных журналов? В каком виде?

6. По какому принципу именуются научно-популярные журналы? Обратите внимание на выбор лексики. Имеются ли существенные отличия от названий материалов в научной периодике?

7. Определите, в каком стиле написаны нижеследующие отрывки из печатных изданий. В каких журналах их можно увидеть?

A. *So what does science look like in the next decade? Collaboration. Transdisciplinary research. Cross-cultural analysis of findings. Creativity and innovation from every field will be (and should be) a crucial element in scientific research. Just as TED's business model is the merging of ideas from every domain to solve world problems, science needs to think in this direction as well. We cannot just sit inside our labs or offices and narrow our focus to our one scientific problem. We need to look to the outside world and all of its influences to help develop the solutions. The problems of science do not belong to just one domain, such as biology, physics, or neuroscience, but to society as a whole. Science influences every aspect of society, so when we look to solve our scientific problems, we need to look to every aspect of society for potential solutions. When we get this cross mixing of ideas, with inspiration sprinkled in from multiple domains, we can generate the best solutions – ones that have the highest potential for success, for we get unique perspectives on these issues that otherwise might never have come to light.*

The days of attempting to solve a scientific problem in a linear, unidisciplinary fashion are coming to an end. Institutions that have already latched on to the new model of collaborative research are in the forefront of discovery. More and more research departments and industries are embracing this transdisciplinary approach, utilizing experts from every domain, such as

economics, math, computer science, biology, psychology, and neuroscience, all striving towards a comprehensive answer to a single problem[1].

B. *Richard Heck (of the University of Delaware), ElichiNegishi (of Purdue University) and Akira Suzuki (of Hokkaido University in Japan) all developed a process known as palladium-catalyzed cross coupling. This technique allows for incredibly complex synthetic carbon-carbon bonded molecules without all the by-products created by older methods.The technique has some pretty amazing implications for both medicine and technology. Discodermolide, a molecule copied from a Caribbean sea sponge's poison, would have been impossible to create in such large quantities without this cross-coupling – and discodermolide shows some pretty fantastic potential as a cancer-fighting drug. Certain parts of consumer tech products like OLED screens (used in some smartphones) also rely on the technique. Even the Nobel Prize for Physics used it in its exploration of graphene*[2].

C. *We have designed a new apparatus, an electrochemical SFA, for measuring the forces between symmetric gold electrode surfaces under electrochemical potential control. The surface separation was determined by two-beam (twin-path) interferometry. The potential was applied to the gold surfaces (working electrode) in 1mM aqueous KClO4 using Ag/AgCl as the reference and Pt as the counter electrode. We observed the van der Waals attraction and the double layer repulsion which decreased with the increasing potential from − 0.1 to 0.2 V (vs. Ag/AgCl)*[3].

D. *The development of a family of chiral bicyclic triazolium salts is described. Treatment of these salts with base provides a nucleophilic*

[1]Transdisciplinary Collaboration (2011)
[2]Nosowitz D. (2010)
[3]Kamijo T. et al (2011)

carbenewhich may be used as an organic catalyst for asymmetric acyl anion chemistry including the benzoin and Stetter reactions, and some recently developed redox chemistry. Throughout the development of these reactions, the nature of the N-aryl substituent on the triazole ring has proven to have a profound effect on both reactivity and selectivity. These observations have also paralleled those made by others using our family of catalysts[4].

E. *Ever wonder where they find all that fizzy water to make soft drinks? Well, they don't. Most soda is made by mixing syrup with water and injecting the mixture with carbon dioxide. Now, two companies in Canada have found a way to deliver the fizz while reducing environmental damage. The Shell Chemicals plant in Scotford, Alberta, makes monoethylene glycol, an ingredient in antifreeze -- and generates 65,000 to 70,000 tons of carbon dioxide each year. But instead of releasing the gas into the atmosphere and contributing to global warming, Shell will deliver it to Air Liquide, a company that supplies soft drink makers. Shell's carbon dioxide arrives with many impurities, including water, hydrocarbons (such as methane, ethane, and ethylene), and dust. Air Liquide cleans the gas by cooling it so the water condenses, heating it to 450*[5].

F. *"Lupinesse", as it is called, is derived from the seeds of the blue sweet lupin, known in this country as lupine. They flower as tall, thin rods — Texas bluebonnet is a lupine, for instance. The blue sweet lupin, which is indigenous to Europe, has a particularly high-protein seed, which is important for developing a creamy consistency. The protein also has cholesterol-regulating effects.Plant-based ice creams are obviously not a new idea — there are several types of soy, coconut and nut-based ice creams on the market,*

[4]Rovis T. (2008)
[5]LaniganD. (200)

targeted for vegans and people with lactose intolerance. But this one is valuable because the plant protein has additional health benefits, and the plant itself has nitrogen-binding roots, so growing it can improve soil quality. Apparently,lupinis considered the "soybean of the north" in Europe.Scientists tried to produce food products from lupin in the 1990s, but they could not make it work. The protein-rich seed of this particular lupin, plus a new production method developed at Fraunhofer Labs, made this new ice cream possible. It comes in Vanilla-Cherry, Strawberry-Mousse, Walnut Dream and Choco-Flake flavor. Too bad, it has just as much fat as regular ice cream[6].

G. *It is no secret that the average American knows very little about science.But according to new research, many women are more likely to know the difference between a Libra and an Aquarius than whether the Earth revolves around the sun.No one is more distressed by this than Florida State researcher Susan Carol Losh, who recently reviewed surveys of basic scientific knowledge conducted by the National Science Foundation. Men and women were asked 10 elementary questions. Women averaged 6.2 correct answers, men 7.4. Most startling, women were much less able to answer such grade-school-level questions as whether Earth's center is veryhot, and whether oxygen comes from plants. But what accounts for women's belief in astrology, which 35 percent say is "sort of" a science, as compared with 25 percent of men? Losh believes it is partly because "women are less likely to feel in control of their futures."But she adds that when it comes to pseudoscience, men may be just as clueless. "Researchers always ask about astrology, so women sound like bimbos", she says. "When they ask about time travel and other 'beam me up, Scotty'*

[6]Boyle R. (2011)

fantasies, men are more likely to be believers. Most researchers are men," cracks Losh. "They probably believe in time travel themselves[7]."

H. *It is highly desirable to develop a chemical system that can mimic the action of enzymes and effect organic reactions in water with excellent efficiency and selectivity. Water is a safe, inexpensive, and environment-friendly solvent, which makes its use favorable in both academic laboratories and industry. The pioneering studies of organic reactions in water by Breslow in the early 1980s triggered a more widespread interest in the use of water as a medium for organic synthesis, not only because these reactions eliminate the necessity for vigorously drying solvents and substrates, but also because of the unique reactivity and selectivity often observed in aqueous reactions. However, the synthesis of spirooxindoles described so far by the three-component reaction of isatin, malononitrile or methyl cyanoacetate, and 1,3-dicarbonyl compounds have limited scope because of the use of transition-metal catalysts, microwave irradiation, surfactants, acidic or basic conditions, and hazardous solvents. As a consequence, the development of environmentally benign practical synthetic routes under neutral conditions using a recyclable catalyst in water for accessing these spirooxindole derivatives still remains a major goal[8].*

I. *The presence of two stereocenters in the piperazine ring, as in structure 5, might have some interesting consequences. In principle, the aryldiazenyl groups in 5 are in nonequivalent environments, and it is an intriguing challenge to see if high field NMR can resolve these nonequivalent aryl groups. Furthermore, there is an element of symmetry in the piperazine ring, which should result in equivalence of the two -C[H.sub.2]CH(C[H.sub.3])-*

[7]Foglino A. (2001)
[8]Sridhar R. et al (2009)

moieties on each side of the piperazine ring, potentially simplifying the NMR analysis. However, the C_2/C_6 carbons in 5 are stereocenters, creating the situation where the methylene hydrogens at C_3 and C_5 are diastereotopic. Thus, the resolution and interpretation of the NMR spectra of the bis-triazenes of type 5 has the potential for being an interesting exercise. These considerations prompted us to explore the effect of introducing two methyl substituents into the piperazine ring of the 1,4-bis(aryldiazenyl)piperazine system and this paper reports the synthesis and characterization of the series of 1,4-di[2-aryl-l diazenyl]-2,6-dimethylpiperazines (5a-51) (Chart 1), with an in-depth analysis of the NMR spectra of these novel[9].

J. *The structural assignments of compounds 2a-2c were based on the analytical and spectral data. The IR spectra of the hydroxylatedchalcones 2a-2c showed the presence of bands at 2921-2852 [cm.sup.-1], which were attributed to the introduction of the long alkyl chain via etherification of 4-hydroxyacetophenone. The presence of a new C=O stretching frequency at 1651 [cm.sup.-1] substantiated the formation of the title compound. The chemical structures of 2a-2c were found to be consistent with [sup.1]H NMR and [sup.13]C NMR spectroscopic data and showed the peaks corresponding to the structures. In [sup.1]H NMR spectra, the coupling constant, = 15.0-16.0 Hz, indicated all chalcones obtained were in trans-configuration*[10].

8. Какие заглавиявы бы далистатьям, отнесенным в категорию научно-популярных? Можно ли их изменить и каким образом для публикации в научных журналах?

[9]Naomi H., Vaughan K. (2010)
[10]Zainab N. et al (2010)

9. Рассмотрите, сравните и прокомментируйте структуры интересующих вас статей. Дайте структурированную характеристику каждого источника. Воспользуйтесь следующими клише.

The title of the paper (under study) I have read is…

So the paper deals with (is concerned with, covers, considers, gives consideration to, describes, gives an accurate description of, outlines, emphasizes, places emphasis on) the problem of…

The author of the paper is a well-known (distinguished, outstanding) scientist in the field of… (The paper was written by a group of scientists from…)

The article was published in 19…, 20… in the journal…

The Structure of the article is as follows. It contains an Abstract, Introduction, Experimental part, Results and Discussion, Conclusions, Acknowledgements, and a List of references.

РАЗДЕЛ 2. ВВЕДЕНИЕ

There is nothing more difficult to take in hand,
more perilous to conduct or more uncertain in its success
than to take the lead in the introduction of a new order of things.
NiccoloMachiavelli (1469-1527)

Написать качественную научную статью на иностранном языке непросто. Основной секрет заключается в том, что писать следует с мыслью о потенциальном читателе, который в общих чертах знаком с областью исследования, но еще не знает о полученных вами конкретных результатах. Излишне при этом упоминать, насколько важна внимательная

работа с уже имеющимися оригинальными научными трудами иноязычных ученых с точки зрения используемого ими стиля, формата, структуры и общего оформления.

Первое, что обращает на себя внимание при чтении научной статьи, – Введение к ней. Оно должно быть составлено таким образом, чтобы сразу же заинтересовать потенциального читателя и убедить, что вся статья заслуживает тщательного изучения. Слишком длинное Введение свидетельствует о перенасыщенности ненужной информацией, что может легко дезориентировать читающего. Необходимо четко помнить, что само Введение подчиняется строгой логике изложения. Оно должно быть скорее емким, а не обширным, движущимся от широкой перспективы к четким, конкретным задачам.

Рассмотрим для примера вводную часть одной академической статьи[11].

Cigarette smoking is a major risk factor for cardiovascular disease as well as for various forms of cancer and pulmonary disease.Smoking also exacerbates a variety of medical conditions and often impedes the successful recovery and treatment of many diseases and medical conditions.

Первое предложение первого абзаца называется *topicsentence* и оказывается ключевым для всего *Введения*, так как привлекает внимание к изучаемой проблеме в общем виде: давно известно, что основной причиной сердечнососудистых, легочных и различных онкологических заболеваний является табакокурение. В следующем высказывании проблема несколько сужается, чтобы появилась возможность перехода к прочим частным проблемам медицины.

Although smoking-induced changes are likely to be multifactorial, recent clinical and experimental studies suggest that oxidants present in cigarette

[11]Schwertner H. (1998)

smoke are a major contributing factor to smoking-induced changes in endothelialand vascular function. Highly reactive elements in cigarette smoke also have been shown to induce platelet activation, lipid and lipoprotein oxidationand DNA adduct formation. Clinical studies have also shown that smoking is associated with other indices of lipid oxidation such as lipid hyroperoxides, malondialdehyde, conjugated dienes and prostanes.

В завершающей части первого абзаца автор раскрывает современное состояние проблемы, указывая, что конкретно изучено и какие успехи достигнуты другими учеными. Именно здесь появляются многочисленные ссылки на их работы. Иными словами, автор проводит тщательный анализ имеющихся наработок, чтобы определиться с кругом решенных вопросов. Затем внимание читателя привлекается к недостаткам и недочетам проведенных исследований.

Even though cigarette smoke has been shown to cause decreases in serum bilirubin concentrations in vitro, the association between cigarette smoking and serum bilirubin concentrations has been limited to studies of serum bilirubin as a risk factor for coronary artery diseases. In both of those studies, the low serum bilirubin concentrations were primarily examined to determine if it was independent of smoking as a risk factor for coronary artery disease.

Сориентировавшись в рамках рассматриваемой проблемы, автор заканчивает вводную часть обязательной формулировкой задач собственного исследования, которые он намеревается решить.

The purpose of this study was to examine the relationship between smoking and serum bilirubin concentrations in individuals without CAD, in individuals with minimal CAD and in individuals with significant CAD. A secondary objective was to determine the association between smoking and other major CAD risk factors.

Таким образом, схематичный шаблон*Введения* можно представить следующим образом.

Таблица 2.

Структурные компоненты *Введения*

Структурная единица	**Содержание**
Параграф 1. *What is the problem*?	Формулировка круга исследуемых проблем; краткая характеристика выполненных работ в этой области для выявления ключевых терминов и формирования общего представления; актуальность и важность
Параграф 2. *Why it is important*?	Описание имеющихся достижений в этой области; выявление нерешенных вопросов, непроверенных методик и прочих «белых» пятен
Параграф 3. *What is the solution*?	Предложение конкретного решения обнаруженной проблемы: краткое описание эксперимента, метода, гипотезы. Постановка задачи исследования.

Проанализируем алгоритм вводной части академической статьи более подробно. Начнем с того, что написание *Введения* – самое сложное при работе над статьей. Большинство тех, кто выберет знакомство с нею, будет склонен моментально получить из Введения сжатое изложение всей выполненной работы. Введение, равно как и вся статья, пишется с точной ориентацией на будущих читателей. Это означает, что следует не просто изложить собственную точку зрения и релевантную информацию, а с помощью логического выстраивания материала объяснить им самое важное, убедив в дальнейшем знакомстве со статьей.*Введение* должно быть кратким и захватывающим, объясняющим причины предпринятого исследования.

Первый абзац *Введения* содержит некую общую проблему из рассматриваемой области науки. Иными словами, это лаконичное изложение современного знания в данной научной сфере. Здесь необходимо помнить о ключевых тематических предложениях, с которых следует начинать каждый новый абзац. Второй сосредоточивается на более специфических вопросах, непосредственно связанных с излагаемым. Здесь может быть информация о проведенных исследованиях ученых разных стран и их достижениях, о недостатках и противоречивых результатах упоминающихся научных работ, об оставшихся за бортом прочих вопросах данной проблемы. Однако не следует приводить подробный литературный обзор, имеющийся на данный момент. Ему отводится достойное место в последующем контексте статьи. Тем не менее, при освещении результатов остальных исследований необходимо дать им критическую оценку, черпая достоверные данные из наиболее весомых работ. Далее привносятся новые подробности предпринятого исследования или определяются его конкретные проблемы. Здесь следует также быть предельно внимательным, дабы не включить в этот раздел вопросы, которым место в части *Обсуждение*. Завершающий параграф *Введения* фокусируется на целях предпринятого исследования, причем сформулировать их следует очень конкретно, сосредоточившись на вопросах, которые предстоит решить. Это самая важная составляющая *Введения*, дающая представление о целях и гипотезах. Именно из его тематических предложений потенциальный читатель должен понять содержание всей последующей статьи и определиться, стоит ему продолжать знакомство с написанным.

Таким образом, во *Введении* формулируется цель статьи, выражается главная идея данной публикации, которая существенно отличается от современных представлений о проблеме, дополняет или углубляет уже известные подходы. При этом обращается внимание на введение в научное

обращение новых фактов, выводов, рекомендаций, закономерностей или уточнения известных ранее, но недостаточно изученных. Цель статьи логично вытекает из постановки научной проблемы и обзора основных публикаций по теме. Ее объем, как правило, составляет абзац, или пять-десять строк.

Избегайте при написании *Введения* включать в него слишком объемные несущественные исторические предпосылки, игнорировать релевантные научные монографии и ссылаться преимущественно на собственные публикации.

ВОПРОСЫИЗАДАНИЯ

1. Сформулируйте основные цели написания вводной части научной статьи. Whatisthemainfunctionofthe**Introduction**?
2. Is it possible to start your paper with a quotation? Как вы считаете, в каких случаях следует начинать свою работу с цитации? Допустимо ли это вообще?
3. Why do you think the introduction is the hardest parts of a paper to write?
4. What information does the reader want to find in the introduction?
5. While reviewing the literature, what sources should be focused on?
6. Why do you think it is necessary to avoid putting ‘text book’ knowledge into the introduction?
7. Why is the last paragraph of the introduction the most essential part of it?

8. **Name the key words of every headline. Is it possible to get rid of some terms? Howcanyoucontractthetitles?**

A pulse radiolysis study of coumarin and its derivatives

Adsorption of bilirubin–albumin complex on the surface of highly dispersed silica

Alternative method for alkylation of arylpolyhalomethanes with trialkylborane in the presence of magnesium

Copper electrodissolution in 1 M HCl at low current densities. II. Electrochemical impedance spectroscopy study

Cyclorhenated compounds derived from 1,4-diaryl-1-azabutadienes: preparation, structures and reactions

Floating electrode dielectric barrier discharge plasma in air promoting apoptotic behavior in melanoma skin cancer cell lines

Intermolecular interactions in the bilirubin-cholate–silica system

Photochemistry and photoinduced chemical cross-linking activity of type I and II co-reactive photoinitiators in acrylatedprepolymers

Phthalocyanines prepared from 4-chloro-/4-hexylthio-5-(4-phenyloxyacetic acid)phthalonitriles and functionalization of the related phthalocyanines with hydroxymethylferrocene

Quantum-chemical calculations of the spatial structure of bilirubin molecule fragments

Recent developments in graphitic materials for conductivity enhancement in primary and rechargeable alkaline batteries

Sublethal and killing effects of atmospheric pressure, nonthermal plasma on eukaryotic microalgae in aqueous media

Synthesis of novel calix[4]arenes containing organosilicon groups Synthesis and structural characterisation of the palladium N-heterocyclic carbene cluster complexes [Pd3(l-CO)3(NHC)3] and [Pd3(l-SO2)3(NHC)3]

9. **По ключевым словам предложите название статьи. Кратко предположите ее содержание.**

A: *translation, science, globalization, English, lingua franca, linguistic imperialism, geopolitics of language*

B: *эдьютейнмент; обучение; развлечение; современные технологии; тематический парк*

10. Прочтите ***Введение*** к совместной статье Бригитты Домик, американского преподавателя университета в г. Падерборн (Германия), и немецкого ученого Герхарда Фишера из Колорадского университета[12]. Предложите свои варианты названия статьи. Предложите набор ключевых слов.

Many real-world problems have become too complex to solve for a single expert out of one discipline. The knowledge relevant to solve complex problemsis increasingly distributed among many people requiring socio-technical environments that bring together people with different, complementary, and often-controversial points of view to form a community. Despite these widely accepted attributes, contemporary higher education is primarily characterized by receiving knowledge out of one single department (usually synonymous with one single discipline), therefore forming specialists with depth in unidisciplinary knowledge and discipline-dependent characteristics (\stereotype). We support «tribal behaviour» in our departments, creating «artists», «computer scientists»and «urban planners», each group harmonizing their own world and suffering from Groupthink.

Another major challenge facing our educational system is that the body of knowledge to be taught in a Computer Science (CS) curriculum expands

[12]Transdisciplinary collaboration (2011)

continuously as testified by the changes in the Computing Curricula recommendations. Even after our students graduate, the body of knowledge will expand and they will be responsible to acquire knowledge without extrinsic motivation (e.g. mandated assessments) both within their own discipline, but in collaboration with others coming not only from their own discipline.

To respond to these challenges, we are engaged in research activities and educational innovations focused on fostering and supporting new learning opportunities based on inter- and transdisciplinary collaboration and lifelong learning that are aimed at (1) having students practice meaningful collaboration with other disciplines, and (2) transforming students from being educational consumers to become socially competent, responsible, self-directed learners.

This paper first defines and explores transdisciplinary collaboration and lifelong learning. We postulate two strategies in a framework, namely breadth-first and Long Tail, that aid in the learning process, before we describe our implementation and experience teaching a one semester graduate course based on our framework. Finally, we discuss implications and future opportunities.

11. **Составьте аннотацию по следующему набору ключевых слов; предложите возможное название статьи.**

Keywords: *English as a lingua franca, native speaker, language learner vs. language user, multilingualism, cross-linguistic influence, partner language, communities of practice, communication strategies, language awareness, intercultural communication competence*

12. **Познакомьтесь с нижеследующим *Введением* из статьи белорусских ученых[13]. Выразите содержание каждого абзаца одним предложением. Какое предложение из текста вы выберете для этого? Сформулируйте основную мысль каждого параграфа.**

[13]Kuz'mitskii V. A. (2001)

Bilirubin IXα (hereinafter referred to as bilirubin) plays an important role in the vital activity of mammals and people. It is formed by the oxidization decay of a heme and represents a yellow-orange pigment that is practically insoluble in an aqueous medium at physiological values of pH. In the case of diseases accompanied by an increase in erythrocytolysis or a decrease in liver function, the content of bilirubin in the blood can be markedly increased, which leads to its accumulation in the skin, which takes a characteristic yellow tinge. Such a physiological jaundice (hyperbilirubinemia) not infrequently develops in newborn babies. One of the methods for treating hyperbilirubinemia is phototherapy, including laser therapy as the most effective method. The point of the method is that the surface of a child's body is exposed to radiation corresponding to the absorption band of bilirubin. The photoproducts formed thereby are more hydrophilic and are removed from the body more easily than bilirubin. The data presented point to the importance of determining the spatial and electronic structure of the bilirubin molecule, including its structure in excited states, and elucidating on this basis the detailed mechanisms of the photochemical reactions determining the action of light.

The basic characteristic features of the chemical structure of bilirubin were revealed by H. Fischerand coworkers in 1941. More comprehensive information on the spatial structure of bilirubin was obtainedmuch more recently thanks to x-ray investigations (which, unfortunately, are not always accurateenough). The x-ray data were substantially supplemented with data obtained by the methods of NMR,circular dichroism and conformational analysis. The most important features of the structureof the bilirubin molecule are as follows (see Fig. 1).

Because of the break of the conjugation chain in position 10, the fragments A + B and C + D can rotate around the C9−C10 and C10−C11 bonds and their π-systems interact rather weakly. The data of the calculations

by the MM method show that the dependence of the potential energy surface on the torsion angles of N22-C9-C10-C11 and N23-C11-C10-C9 is rather complex: besides the global minimum, there are also local minima on the potential energy curve, the transitions between which, according to [13], determine the interconversion of the levo- and dextrorotary conformers responsible for the circular dichroism of bilirubin in solutions. The intramolecular hydrogen bond (Fig. 1) stabilizes the conformers, giving them a plicate structure resembling a ridge tile, which can be observed in the crystalline state. Moreover, as a result of the formation of hydrogen bonds, the polar fragments COOH of the 2-carboxyethyl group (residuals of propionic acid) are blocked, which explains the poor solubility of bilirubin in water. Under normal conditions, the so-called Z-configuration giving mutual orientation of fragments A and B or C and D with respect to one another (the torsion angles of the N21-C4-C5-C6 and N22-C6-C5-C4 type should be (formally) close to zero) is realized.

The present work is devoted to obtaining structural information on the properties of the bilirubin molecule on the basis of quantum-chemical calculations. In view of the fact that the bilirubin molecule features conformational flexibility, it makes sense to focus our attention on structures like the bilirubin molecule "halves" A + B and C + D. We have made a search for optimized geometry of a number of fragments of the bilirubin molecule in the ground state with increasingly complicated structures (Fig. 2). We have also made calculations of their excited states. The data obtained should be considered as the basis for more detailed investigations of the physicochemical properties of the bilirubin molecule by quantum-chemical methods, in particular, when taking into account variations in its geometry.

Каков алгоритм написания данного *Введения*? Какая информация включена в каждый параграф?

13. **Еще одно *Введение*заимствовано из статьи американских исследователей[14]. Проанализируйте, по какому принципу оно составлено.**

Primary and secondary alkaline batteries of the electrochemical system Zn/KOH/MnO2 represent the second largest market in the worldwide battery industry in terms of production volume. The annual production of such batteries is estimated to exceed 10 billion cells worldwide. Fast shift of this technology to commodity pricing, as well as growing competition with some advanced rechargeable battery systems for both new and traditional alkaline-Manganese Dioxide battery applications has recently resulted in a very significant evolution in the development of the battery chemistry. What used to be for decades a conservative industry is currently undergoing breakthrough changes, often resulting in the commercialization of significantly improved products.

Graphite powder is used for the purpose of conductivity enhancement in the MnO_2 (EMD or CMD) cathodes. The powders as well as graphite-containing conductive suspensions (used as a processing aid and a conductivity bridge at the challenging interface: EMD cathode-positive current collector) have played important roles in the development of new alkaline battery systems, which entered the market in 1998-2002.

It is obvious that big changes had to take place in graphite technology in order to make the above advancements possible. The purpose of this work is to introduce some of the latest developments in graphite technology to the battery developers and manufacturers.

14. **Каким должно быть первое предложение *Введения*? С чего, по-вашему, лучше начинать описание – с общего или частного? Представьте, что вам нужно написать статью о роли английского**

[14]Barsukov I. V. et al (2003)

языка в мировой науке. Какое начало вы считаете наиболее соответствующим этой теме? Приведите свои аргументы.

In recent years, the term «English» as a lingua franca (ELF) has emerged as a way of referring to communication in English between speakers with different first languages.

English has established its position as the global lingua franca beyond any doubt; along with this status, it has become one of the symbols of our time, together with globalisation, networking, economic integration, and the Internet.

English is widely regarded as having become the global language – but will it retain its pre-eminence in the 21st century?

15. **Познакомьтесь с нижеследующими выдержками из вводной части разных академических источников. Подчеркните используемые стандартные конструкции, выпишите и классифицируйте их по соответствующим категориям.**

Considerable effort has been devoted to the study of the structural and dynamical properties of water by both experimental and computer simulation methods. Despite these efforts, the problem remains a challenge mainly due to the directional nature and strength of the hydrogen bonds, leading to rather complex cooperative phenomena.

Until recently, the Narten and Levy x-ray scattering studies and neutron scattering experiments by Soper and Phillips and Soper, Bruni, and Ricci were considered the most reliable sources for RDFs of water at ambient conditions.

Molecular dynamics (MD) simulation in its classical and ab initio forms is a powerful technique to aid in resolving of significant uncertainties in the understanding of the microscopic structural and dynamical properties of liquid water.

The initial purpose of our simulations was to compare the effects of different plane-wave cutoffs on the resulting structural properties of the water, such as the RDFs.

Water is an essential and ubiquitous component of our natural environment crucial to many chemical, biological, and physical processes. The importance of water has led to the development of many models for the interaction between water molecules, i.e., force fields.

Copper electrodissolution has been studied experimentally, at low current densities, by EIS in a neutral chloride medium and in aHCl medium.

Amino acids exist as zwitterions in the crystalline state and in solution, stabilized by electrostatic, polarization, and H-bonding interactions with their environment.

The interest in the shapes and spectra of the conformationally flexible free amino acids, the building blocks of peptides, the backbones of proteins, stems from at least three reasons…

Further experimental studies by low-resolution photoelectron spectroscopy did not yield any conformational information about α-alanine. Even after an extensive search of the literature no experimental studies, but a matrix infrared study of proline, on the shapes and spectra of free amino acids other than glycine and -alanine have been found.

Although there have been a number of nonempirical theoretical studiespublished on free amino acids, only a few of them are exhaustive and dependable.

The purpose of the present study is to determine the precise geometrical structure in the gas phase of nicotine by means of electron diffraction combined with theoretical calculations.

Much work has been carried out on the application of electrical discharges for air pollution control. This includes the abatement of acidic gases

(SOx, NOx) green house gases (CH4,CO2, etc), toxic volatile organic compounds (VOCs), hazardous particulates and harmful microorganisms.

A supersonic expansion coupled to an electronic discharge represents an extremely valuable tool for the production and the study of translationally and rovibrationally cold radicals and ions.

A quantitative and qualitative description of the properties of the plasma is also a key requisite to correctly assess the relevance of the ion formation mechanisms to the astrophysical application.

While detailed information is available for plasmas used in industrial applications (e.g. lighting, gas discharge lasers, pollution control and reduction, material processing), little seems to be known—as far as we can say—on plasmas that are generated in free jet expansions coupled to a discharge (i.e. 'cold' plasmas) motivating the work described here.

Recently, plasma technology applied to wastewater treatment has attracted a great deal of attention from environmental chemists, mainly because of its amenability to automation, its high efficiency and environmental compatibility. Many processes have been developed, among which the anodic contact glow discharge electrolysis was regarded as the most promising technology because it did not need a special power source or an evacuating system.

However, the shortage of detection sensitivity due to the extremely low sample volume is frequently a serious problem of μTAS.

Growing worldwide concern for environment protection has driven the development of a number of advanced oxidation technologies for water cleaning. These include water treatment with ozone, UV-radiation, γ -radiation, electron beam, supercritical water and electrical discharges. The electrical discharges, particularly pulsed corona discharges (PCDs) seemto be themost promising because of the followingadvantages.

The PCD (pulsed corona) discharges technique has become the subject of a number of studies in the recent pastand it is being tested on an industrial scale.

In this study, the use of plasmacatalysts has been extended to water treatment for the first time. Furthermore, the synergistic effect of the simultaneous addition of ozone and plasmacatalyst in the discharge gap of a PCD reactor has been reported here for the first time.

During the last years, many efforts have been aimed to produce nano-sized titania powder with high specific surface area using techniques such as sol-gel process, direct deposition from aqueous solutions, ultrasonic spray pyrolysis, laser-assisted pyrolysis, co precipitation method and hydrothermal crystallisation.

16. **Что, по-вашему, следует изменить в следующих предложениях?**

Since much literature is available on pulsed corona discharge processes for water purification and semi-industrial scale plants based on this technique are being evaluated, it is highly desirable to study the synergistic effect of ozonation and pulsed corona discharges.

With the rapid increase in the number of chemical industries, a huge quantity of wastewater is produced, which causes pollution and degrades the environment. Many of these industrial wastewaters, especially wastewater containing phenolic compounds, are well known to be characterized by high salinity, high acidity, high chemical oxygen demand (COD) and low biodegradability, which means that the effluent cannot be treated by the conventional process. An alternate method of treating such wastewater is by advanced oxidation processes (AOPs), where highly reactive free radicals, especially hydroxyl radicals, are mostly utilized to destroy the pollutants in the water.(JinzhangG. et al, 2003)

We report an extension of our previous ab initio study on the potential-energy surface (PES) of the electronic ground state of NH_3 at the CCSD(T) level.

We have chosen to explore the alternative empirical approach of refining the ab initio potential-energy surface against experimental data.

The comparison of the experimental and model behaviours give us assumptions on the mechanism kinetic. The kinetic limiting current, used to fit the experimental i vs E curves, was found to depend both on potential and mass transfer.

17. **Упростите слишком длинные и громоздкие фразы:**

A huge quantity of wastewater is produced from industrial processes. It is mandatory to develop efficient and cheap processes for converting aqueous pollutants into harmless products. A number of alternate advanced oxidation processes (AOPs), such as direct ozonation, UV radiation radiation by electron beam or γ -rays, electrical discharges or combination of these processes, are being studied for oxidation of aqueous organic pollutants. Pulsed corona discharge is one of the most promising electrical discharge processes for water purification, because it produces several strong oxidizing agents, which, in turn, can decompose a range of organic pollutants in water. (Malik M. et al, 2002)

18. **Продолжитефразу**: *one of the most important properties of a paste is the viscosity of the liquid phase*. **Что, по вашему мнению,можноописыватьдальше?**

19. **Познакомьтесь с некоторыми *Введениями*, выскажите свое мнение о них. Назовите положительные и отрицательные стороны. Какой части *Введения* они соответствуют? Предложите, что в них следует изменить.**

A. *After successful structure determination of typical mesogens, MBBA (4-methoxybenzylidene-4'-n-butylaniline) and PAA (p-azoxyanisole), by gas*

electron diffraction, we became more confident that this experimental technique can be applied to larger and more complicated molecules than what had so far been studied by this method. Therefore, we have decided to make the investigation of geometrical structures of some bioactive compounds our next project. As the first target of this line, we have chosen the geometrical structure and conformation of nicotine (Figure 1), a strong agonist of the nicotinic acetylcholine receptor (nAChR).[15]

B. *The paper is structured as follows: in Section 2 we describe the ab initio calculation of the dipole moment surface and the analytical representation of this surface. Section 3 discusses, in a similar manner, the potential energy surface of PH3 employed in the present work. In Section 4 we give some details of the intensity calculations whose results are reported in the following sections. Section 5 presents the vibrational transition moment values computed with the new ab initio DMS; these are compared to the experimental and theoretical values available in the literature. In this section we also present theoretical simulations of the absorption spectra for a number of bands and line strength calculations for transitions between the cluster states mentioned above. Section*

6 offers conclusions[16].

C. *In section 2, we describe the experimental set-up and discuss the parameters that are associated with the plasma generated in the experiments. In section 3, a step-by-step modelling of the plasma is attempted and, finally, in*

[15]TakeshimaT. et al(2002)
[16]Yurchenko S. N. et al (2006)

section 4 we discuss the results of the model and the implications for the study and the optimization of the yield of cold molecular ions[17].

D. *The paper is structured as follows. Section II describes the ab initio methods employed and defines the selected sets of nuclear geometries. Section III specifies the procedure for determining the CBS** energies. The analytical representation of the potential-energy function is the subject of Sec. IV, and Sec. V gives the details of the variational nuclear-motion calculations. Section VI discusses the properties of the analytical potential-energy surfaces and compares the variational results for the ab initio surfaces against experiment. Section VII presents a refined PES obtained from a restrained fit to experimental data. Finally, Sec. VIII offers a discussion and conclusions*[18].

20. **Перефразируйте предложения, чтобы они выражали цели предпринятого исследования.**

We validate our newly calculated DMS by comparing the vibrational transition moments and intensities from the present work with the available experimental data. We also compare our transition moments with results of the DFT study by He et al.

The ozonation process can be made more competitive by (a) improving the energy efficiency and ozone yield of the ozone generator, (b) developing better ozone–water contactors, and/or (c) catalyzing the chemical reactions of ozone.

Therefore, it is desirable to see how the decomposition rates of pollutants in distilled water differ from those in water having high conductivity. We have carried out experiments in distilled and tap water under the experimental conditions.

[17]Remy J. et al(2003)
[18]Yurchenko S. N. et al (2005)

Therefore, it is mandatory to develop efficient and cheap processes for converting these aqueous pollutants into harmless products.

We propose, in this paper, to study the Faradaic impedance related to the above mechanism and to determine the limiting possible shapes of the Faradaic impedance. The theoretical and experimental results will be compared and discussed using the assumptions of a pseudo-Tafelbehaviour and a low adsorbate coverage ratio.

This paper deals with the relation between stable sol preparation processing parameters (such as peptisation temperature and TiO_2 concentration) and the characteristics of powders obtained from these sols (such as phase structure, crystallite size, relative amount of phases, anatase-to-rutile phase transformation and the specific surface area). The influence of water/titania ratio, as well as peptisation temperature and acid/titania ratio, on characteristics of powders is reported in this study.

21. **Проанализируйте алгоритм нижеследующих *Введений* и перескажите их.**

A. Investigating the processes in nature and carrying out chemical reactions, one is searching for solvents, in which the investigated processes could be reproduced as precisely as possible, with the reactions proceeding with maximum yield. Scientists search for relationships between energetic effects of the investigated processes or the reaction yield and the properties of organic solvents or mixed solvents. Knowing such relationships one will be able to model various processes as well as to foresee the direction and yield of chemical reactions. To assess the properties of organic solvents, the following parameters have been used: non-specific parameters, Y and P, of solvent polarity and polarisability, structure parameters S, donor (DN) and acceptor numbers (AN), Lewis acidity (E, E) and Lewis basicity (B), excess heat of mixing water with organic solvent (H) and excess molar volume of mixture (V) as well as many

others. Although the number of parameters describing the properties of pure organic solvent is large, it is difficult to find such parameters of mixed solvents, especially water-organic solvents as their number is limited just to several of them.

In the previous paper the dependence of solution enthalpy of crown ethers 15-crown-5 (ISCS) and benzo-15-crown-5 (BISCS) in {(1 – x)AN + xHO} mixtures and {(1 – x)PrOH + xHO} on the acid-base properties of these mixtures was presented.

In the present paper the influence of acid-base properties of {(1 – x)AN + xHO} on the dissolution enthalpy of cyclic ethers: 1,4-dioxane, (6C2), 12-crown-4 (12C4), 15-crown-5 (15CS) and 18-crown-6 (18C6) including their dependence on the number of –CH:CH- groups are discussed[19].

B. Studies of selective interactions of saccharides with macrocyclic ligands in solution have intensified in recent years. The increased interest is connected with a search for new synthetic saccharide receptors and their practical applications as well as elucidation of pharmacological activity of drugs.

Studies of interactions of mono- and disaccharides with 18-crown-6 in dilute aqueous solutions have demonstrated that some saccharides from molecular complexes with the macrocycle. Selectivity of the interaction is determined by two factors, hydration of the saccharide molecule and the presence of appropriate centers for binding. The present work reports a study of the heat effects of solution of 18-crown-6 in monosaccharide-water mixed solvents in order to get more information about an influence of the hydration on the saccharide-macrocycle interactions[20].

[19]Jozwiak M. (2009)
[20]Volkova N. L. et al (2006)

Задания для самостоятельного анализа и пересказа вводной части оригинального источника:

1. Explain the broad issues under investigation.
2. Formulate the urgency and necessity of the general problem.
3. Say how the authors explain the importance of the study undertaken.
4. Review the literature mentioned to identify theories and existing evidence.
5. Nameboth positive and negative features of the studies performed by other scientists.
6. Give examples of topic sentences introducing every new paragraph; pay attention to brief conclusions at the end of each clause.
7. Render every paragraph in one sentence.
8. Formulate the purpose of the investigation undertaken.
9. Give your opinion whether it was worth doing such a research. Provide a broad context.
10. Point out the clichés and linking expressions.

Prepare a draft introduction for your investigation: start the section with a general background of the topic; add two paragraphs that discuss previous works (their advantages and disadvantages); point out issues that are being addressed in the present work. Remember to use **present or past simple tense** to describe

the evidence that exists while presenting your objectives and hypothesis **past simple** tense is preferable.

РАЗДЕЛ 3. ЭКСПЕРИМЕНТАЛЬНАЯЧАСТЬ

I have always attached great importance to the manner
in which an experiment is set up and conducted ...
The experiment should be set up to open
as many windows as possible on the unforeseen.
FredericJoliot-Curie (1900-1958)

Экспериментальная часть научной статьи (*MaterialsandMethods; Experimentalpart; Experimental*) является наиважнейшим аспектом исследования, так как содержит информацию, по которой легко определить обоснованность проведенного исследования. Поэтому необходимо четко и точно описать, как проводился эксперимент, и аргументировать, почему для него была выбрана та или иная специфическая методика. Данный раздел выстраивается таким образом, чтобы само изложение эксперимента отвечало на ключевой вопрос исследования, приводя при этом факты, объясняющие, как оно проводилось, обосновывало стратегию эксперимента, объясняло, как анализировались результаты. Следовательно, данный раздел нужно писать с учетом того, чтобы эксперимент оказался легко воспроизводимым с целью получения идентичных данных, и читатель смог сам определить ценность и значимость полученных результатов.

Применение любого научного метода предполагает выявление причинно-следственных связей между явлениями или процессами, что, в

свою очередь, зависит от заранее продуманного плана проведения эксперимента [4]. Предварительно проработанный исследовательский проект являет собой определенную стратегию контроля и интерпретирования тех или иных значений, с помощью которых дается ответ на поставленный в исследовании вопрос. Обоснованность выводов базируется на достоверности экспериментальных результатов и того, насколько широко их можно применять в данной научной отрасли. При этом можно выделить внутреннюю мотивированность, связанную с тем, насколько точно представленные выводы соотносятся с тем, что действительно было обнаружено. Внешняя мотивированность определяется тем, насколько полученные результаты легко обобщить и свести к общим законам.

В течение длительного времени в прошлом методическая часть исследования называлась «Материалы и методы», чтобы выделить два самостоятельныхраздела исследования. Термином *Materials* именовались изучаемые объекты, процедуры и инструментарий. Под термином *Methods* объединяли те процессы, которым подвергались исследуемые объекты, чтобы объяснить, как проводились измерения и расчеты и каким образом анализировались данные. Сейчас наряду с названием «Материалы и методы» применяется обозначение «Экспериментальная часть».

Следует учитывать три важных момента. Во-первых, все эксперименты, как правило, проводятся на доступном промышленном оборудовании с использованием известного инструментария, поэтому необходимо лишь точно описать применяемое. Во-вторых, может употребляться аппаратура, изготовленная в лабораторных условиях, не содержащая, однако, никаких нововведений. В таком случае необходимо представить данную экспериментальную установку в соответствующем разделе. Если же инструментарий был модифицирован и содержит

новаторские элементы, все внесенные подробности освещаются в этой части, а полученные благодаря этому результаты – в последующих [6]. Поскольку успех эксперимента во многом зависит от оригинальности и особенностей создания экспериментальной установки, описательная информация включает комплект аппаратуры, способы их соединения, добавочные элементы, сделанные собственными руками,так как именно эти новации будут представлять определенную сложность при воспроизведении проведенного эксперимента.

В связи с этим в разделе *Обсуждение* неизбежно появится соответствующий параграф, указывающий на новый нестандартный подход, важный для сообщества ученых-химиков. Необходимо привести наиболее значимые результаты, полученные благодаря внедрению инноваций, которые описываются с точки зрения действия установки. Однако следует соблюдать меру, избегая излишне многословного изложения и повторного описания используемого оборудования. Технологические сложности научных изысканий требуют, чтобы описание методов было четким и ясным во избежание разночтения и двусмысленности.

Для выявления алгоритма представления материалов в этом разделе разберем в качестве примера часть «Материалы и методы» из оригинального источника[21].

All reagents used in this investigation were MERCK and SIGMA brand, standard analysis quality. The reaction medium was an aqueous solution of sulfuric acid. The water was previously distilled and deionized. The ferrous sulphate, ferric sulfate and hydrogen peroxide solutions were titrated according to the methods described by Vogel. In all kinetic experiments concentrations of

[21]Camarero L. et al (1997)

hydrogen peroxide and protons were in an excess compared to the colorant concentration.

Потенциальный читатель статьи должен знать все: марку и производителя приборов, поставщика химических реактивов и лекарственных препаратов, точное название программного обеспечения и прочие немаловажные детали исследования. Следующий абзац экспериментального раздела рассказывает о том, какое оборудование привлекалось для осуществления выше обозначенных целей и задач:

The progress of the reactions was monitored by measuring the absorbance of the reactive mixture. An UV-vis. UVIKON-930 spectrophotometer, equipped with a thermostatic system by forced water circulation was used.

В тексте этого раздела также можно встретить описаниепроцедуры обработки изучаемых препаратов:

Unless otherwise indicated, treatment of loomstate (starch sized) cotton fabric with $KMnO_4$ and grafting of the so treated fabric were carried out as described below.

уточнение хронологии проведения лабораторных тестов:

All blood samples were collected after a 12 h fast and prior to other testing. High-density lipoprotein cholesterol was analyzed after precipitation of the apo-B lipoproteins with either phosphotungstate-magnesium reagents or dextran sulfate.

указание на использованные статистические методы:

The study involved a study group of 715 individuals of whom 153 were current smokers, 251 had quit smoking and 311 never smoked. The Mantel-Haenszel chi-square test was used to test the association between smoking and serum bilirubin concentrations. One-way analysis of variance F-tests were used

to compare clinical and laboratory characteristics with extent of smoking and with severity of CAD.

Следовательно, рассматриваемыйэкспериментальный раздел также без особых затруднений укладывается в рамки структурирования, поскольку легко вычленяются следующие основные положения:

- описание используемых материалов;
- объяснение процессов их получения;
- описание протокола исследования;
- изложение того, как проводились измерения и расчеты;
- упоминание об используемых статистических способах обработки данных.

Второй важный момент касается того, что описание должно быть простым и точным, **исключительно в простом прошедшем времени**. Следует избегать сложных грамматических конструкций, а также включения несущественных подробностей. Если подробностей слишком много, дополнительную информацию следует приводить в виде подразделов, не забывая главный принцип построения каждой части **от самого главного к менее существенному**. Все вышеуказанные составляющие раздела рекомендуется четко и логично скомпоновать в хронологической последовательности.

Итак, в данном разделе следует описать использованные материалы, вещества и реагенты, объяснить, как их готовили, снабдить протоколом исследования, описать, как проводились измерения и расчеты, упомянуть статистические приемы для анализа данных. Необходимо четко помнить, что если по вашему описанию нельзя повторить эксперимент, вся работа оказывается бессмысленной.

Протокол исследования предполагает не что иное, как изложение последовательности всех манипуляций и расчетных процедур

эксперимента, при этом четко соблюдается их точная хронологическая последовательность. Как правило, это описание исходных условий и измерений, а также дальнейшая регистрация всех изменений. Далее следует объяснить, какие переменные были обнаружены и как их замеряли. Описание экспериментального инструментария включает название модели прибора и изготовителя, компанию и страну, поставившую оборудование. Здесь же целесообразно представить таблицу или схематичную диаграмму для объяснения проводимых процедур для получения, например, конкретных образцов.

Завершающий абзац раздела сосредоточивается на том, чтобы прояснить, как данные будут представлены в следующей части статьи, какие статистические аспекты будут привлечены для их интерпретации.

Таким образом, содержание раздела *Материалы и методы* можно схематично представить в виде следующей таблицы.

Таблица 3.

Структурные компоненты *Экспериментальной части*

Структурная единица	**Содержание**
Параграф 1. *How did you study the problem*? *What did you do*?	Общее описание используемого научно-методического подхода
Параграф 2. *What did you use*?	Детальное описание применяемых материалов и оборудования
Параграф 3. *What were the conditions*?	Изложение этапов и основных шагов экспериментального исследования

Можно смело утверждать, что экспериментальный раздел является самой важной частью статьи, так как именно на этом основании потенциальный читатель приходит к мнению о значимости и весомости предпринятого исследования.

ВОПРОСЫ И ЗАДАНИЯ

1. What is the purpose of the section *MaterialsandMethods*?
2. What should be included into the section *MaterialsandMethods*?
3. **Take any paper close to your research. Read it through and give examples of the descriptions of**:

- instruments, instrumentation, equipment available;
- specialized equipment, modifications to equipment, equipment constructed specially for the study;
- materials and reagents;
- suppliers;
- procedures;
- the methods used to prepare reagents, fixatives;
- particular techniques;
- modifications of any techniques;
- statistical methods, software programs;
- clarification why each procedure was done;
- explanation how measurements were made.

4. What techniques of writing research papers are most typical for your field of science?

5. What is the function of transition words such as *also*, *furthermore*, *in addition*, *first*, *later* etc.?

6. Differentiate which transition words have the function of adding more thought and which arrange ideas in order, time and space: *afterwards, also, besides, beyond, finally, first, furthermore, in addition, in front, later, next*

7. Retell the experimental section of any paper you have read. Briefly explain the general type of scientific procedure you used. Describe what materials, equipment (chemicals, apparatus, etc.) you used. Explain the steps you took in your experiment.

8. Read the following *Experimental* parts; find out their algorithms; copy clichés.

A. *The mass fraction purity of each material is as follows: 1,4-dioxane (Aldrich, 0.99+) "purum" 12-crown-4 (Fluka, ≥0.98) "purum" 18-crown-6 (Fluka, ≥0.99) were used as received. Anhydrous acetonitrile (Aldrich, 0.998) was further purified by the method (described in the literature).*

Calorimetric measurements were performed over the whole mole fraction range of water in the mixture at T = (298.15±0.01)K, using an "isoperibol" type calorimeter as described in the literature. The calorimeter was calibrated on the basis of the standard enthalpy of solution at infinite dilution of urea (Calorimetric standard US, NBS) in water at T = 298.15K. The value obtainedfrom 10 measurements in this study was (15.30±0.07) kj·mol (literature data 15.31 kj·mol, 15.28 kj·mol. Thus, the uncertainties of the measured enthalpies of solution did not exceed ±0.5% of the measured value. Six to eight independent measurements were carried out for each investigated mixture. There is no dependence of the solution enthalpy of the examined cyclic ethers on concentration within the correlation range used for the cyclic ethers in a mixture with a given composition. For this reason, the values of the standard solution enthalpy (Δ H) in all the systems under investigation were calculated as

mean values of the measured enthalpies. The results obtained are presented(in Table 1).[22]

B. *18-crown-6 (1,4,7,10,13,16-hexaoxacyclooctadecane) (MP Biomedicals), D-glucose, D-galactose, ... (Fluka, >99% pure) were used without further purification. All chemicals were dried in vacuum at 323K (crown ether) and 343K (monosaccharides) during several days before use. Solutions were prepared by weight in doubly distilled deionized water.*

Enthalpies of solution of 18-crown-6 in different monosaccharide-water mixtures were measured with an isoperibol calorimeter at 298.15. The amount of 18-crown-6 in glass ampoule was ≈0.02g. The ampoule breaking-heat effect was negligible. The uncertainty in the measured enthalpies was estimated to be ±0.6%. The solute molality in all cases was estimated to be ≈1x10^{-3}mol kg^{-1}, which can be considered as infinitely dilute, and the measured enthalpies of solution were regarded as standard enthalpies of solution. The obtained value of the standard solution enthalpy of 18-crown-6 in water is in a good agreement with literature data.[23]

C. *The sample was synthesized via the catalytic decomposition of ferrocene under a methane gas flow in a quartz tube reactor inside a dual zone furnace. Ferrocene is the iron source while methane acts as the carbon feedstock and the carrier gas. The main parameters are the sublimation temperature of ferrocene (applied in the first furnace stage), the deposition temperature (in the second furnace stage), T = 174 °C, T = 950 °C, respectively. The methane flow rate was 200 ml/min. The reaction time was 0.5 h. Before the*

[22]Jozwiak M. (2009)

[23]Volkova N. L. et al (2006)

process took place, the system was evacuated to ca. 10–3 mbar at room temperature.

Annealing in air at 350 °C for 1 h purified the as-produced material and then various acid treatments (2M, 3M, 4M HCl) were performed for further purification. Afterwards, the product was filtrated, washed thoroughly with distilled water and acetone. The sample was prepared on the standard copper TEM grid and characterized using transmission electron microscopy (TEM), electron energy-loss spectroscopy (EELS) and its high angle annular dark field (HAADF) mode, energy dispersive X-ray (EDX) analysis and selected area electron diffraction (SAED).[24]

9. Read the part of the *Experimental*. How can you subtitle it?

The chemical structures of the photoinitiators, their chemical names and suppliers are shown in Structures A–H. The solvents dichloromethane, pyridine, methylcyclohexane, acetonitrile, isopropanol and compounds used in the synthetic procedures below in this work were obtained from Aldrich Chemical, UK. All the solvents were of HPLC grade quality. The 4-(2-hydroxyethoxy)-phenyl-(2-hydroxy2-methylpropyl)ketone (Irgacure 2959) was obtained from Ciba-Geigy, Switzerland. The 4-hydroxybenzophenone was also obtained from Aldrich. The prepolymer resins, water based urethane acrylate,Actilane 890 (melamine acrylate) and Actilane 430 (acrylatedtrimethylolpropaneethoxylate) were supplied by Akcros Chemicals, Manchester.[25]

10. What procedure is describedunder the subtitle *AcrylatedIrgacure 2959*with the help of the following set of phrases? Restore the passage with the presented scheme.

A number of successful established routes; relatively high yields; depending upon the conditions;the Irgacure 2959; to dissolve in

[24]Costa S. et al (2007)
[25]Allen L. et al (1999)

dichloromethane and pyridine for 30min at 0°C; a solution of acryloyl chloride in dichloromethane; to add drop-wise over a period of 20min; keeping the temperature at 0°C; addition of dimethyl aminopyridine (catalyst); followed by stirring overnight for 18 h at room temperature; to dilute with water; to extract with ether; to wash with dilute hydrochloric acid and copper sulphate solution; to remove all the pyridine; to repeatedly wash with water; to dry over anhydrous $MgSO_4$; to filter the solution; to remov the solvent by rotary evaporation; to leave a yellow liquid.

11. **Which method is described below? Name the equipment used, its functions, description, specification**.

Absorption spectra were obtained using a Perkin–Elmer Lambda 7 absorption spectrometer on solutions of photoinitiators in three solvents of different polarity in order to study the effect of solvent polarity on the absorption properties of photoinitiators such as hyperchromic and hypochromic effects and hypsochromic and bathochromic shifts. Chloroform, acetonitrile and 2-propanol were the chosen solvents. UV spectroscopic studies were conducted using quartz cells with a path length of 1 cm. The sample in the cell was subjected to ultraviolet light between 200 to 500 nm and the extinction coefficients were calculated using the Beer-Lambert's Law.[26]

12. What measurements are widely used to study the photochemical processes occurring by a molecule upon the absorption of light? What information of a molecule provide phosphorescence measurements? Why quantum yield calculations are extensively used?

13. Read the description of time resolved absorption spectroscopy set-ups. Name all important parts and details of the equipment used.

End-of-pulse transient absorption spectra on the millisecond time scale were obtained using a kinetic flash photolysis apparatus equipped with two

[26]Allen N. et al (1999)

xenon-filled flash lamps (operated at 10 kV) and a 150W tungsten-halogen monitoring source. Transient decay profiles were stored using a Gould Model 1425 storage oscilloscope. Solutions were deoxygenated using white spot nitrogen gas (<5 ppm O2). Laser flash photolysis experiments were carried out using a frequency-quadrupled neodymium laser (J.K. Lasers Ltd.) which delivered 12 ns pulses of 266 nm radiation of energies up to 50–60mJ. Transient absorption changes were measured by illuminating the quartz reaction cell (1 cm path-length) with light from a pulsed xenon lamp. Wave-length selection was achieved with a diffraction grating, high irradiance monochromator with a 5 nm band-width. Kinetic changes in the light signal at preselected wavelengths were detected and amplified using a Hamamatsu R1477 photo-multiplier prior to collection by a programmable digital oscilloscope (H P54510A). Solutions were deoxygenated using white spot nitrogen gas (<5 ppm O2).[27]

14. Name the reagents suppliers. How are they mentioned in the text?

We used highly dispersed amorphous A-300 silica with the specific surface area of 300 m2/g (Kalush, Ukraine), bilirubin, reagent grade, (Fluka, Switzerland), lyophilized bovine serum albumin, reagent grade, (Biolar, Latvia), sodium chloride, reagent grade, (Merck, Germany), standard titers NaOH and HCl (Titrisol, Merck, Germany).[28]

15. Read the description of a typical synthesis procedure. Paraphrase the underlined sentences using other grammar constructions.

The synthesis of 1-(3-fluorophenyl)propan-1-ol is representative. To a suspension of magnesium powder (21 mmol) in DMAc (1 mL) is added triethylborane (1 Nin THF, 4 mmol). The temperature is allowed to rise to 32°C in few minutes. The solution of 3-fluorobenzal chloride (0.63 g; 3.5 mmol) in

[27]Allen N. et al (1999)
[28]Vlasova N. N. et al (2007)

DMAc (1 mL) is slowly added (7 drops per minutes).The reaction temperature rises slowly for a while; the reaction mixture turns to yellow. Then the reaction temperature is controlled and maintained below 35°C. After 30 min, the remaining magnesium is filtered off. NaOH (3 N, 2 mL) and H_2O_2 (3 mL) are carefully added at 0°C to the filtrate, while keeping the temperature below 50°C. After stirring for 1 h at 50°C, themixture is cooled down; saturated $NaHCO_3$ aqueous solution (30 mL) and diethylether are added. The aqueous layer is extracted twice with diethylether (30 mL). The collected organic layers are washed with distilled water and NaCl saturated solution. The product is dried over$MgSO_4$ and after the evaporation of the solvent is purified by column chromatography.[29]

16. Categorize the following expressions and statements. What do they inform the reader about? Name the function of each sentence.

The sample of nicotine with purity of better than 98% was purchased from Sigma Chemical Co. and was used without further purification.

To get enough sample pressure, a high-temperature nozzle2 was used with the nozzle tip temperature of 116 °C.

The photographic plates were developed for 4.5 min in Dektol developer diluted 1:1.

In our simulation with 64 H_2O molecules we have used a cubic supercell with a side length of 1.2417 nm. The respective length for a system of 32 H_2O molecules was 0.9856 nm.

The simulations were carried out at two different plane-wave cutoffs of 50 and 80 Ry, representing ‘‘bad’’ and ‘‘good’’ cases for water.

The initial configuration in the first simulation was obtained by carrying out a classical MD simulation using the polarizable and flexible (Polarflex)

[29]Toshie A. et al (2010)

water potential based on the multistate valence bond (MS-EVB) method that was developed in Ref. 20.

Due to its agreement with experiment, the Troullier-Martins pseudopotential and gradient-corrected density functional BLYP were used.

The quantum-chemical calculations were done at the CCSD(T) level (coupled cluster theory with all single and double substitutions from the Hartree-Fock reference determinant augmented by a perturbative treatment of connected triple excitations) using the MOLPRO2000 package.

We thus have to find a "border" in the six-dimensional coordinate space that envelopes the geometries with a potential energy of up to 20 000 cm^{-1} which we need to cover with ab initio points.

Titanium tetraisopropoxide (TTIP) with a purity of 97% (Aldrich, UK) was used as precursor; analytical grade hydrochloric acid (HCl) 37% (Fisher, UK) was used as a catalyst for the peptisation and deionised water was used as a dispersing media.

For each sol, water-acidmixture (in the range of pH = 1–2) was stabilized at a constant temperature, and this temperature was kept throughout all the experiment, together with continuous stirring.

Sols were characterized in particle size by dynamic light scattering technique (DLS) using a Malvern ZetaSizer 3000 HS at 20°C using a 10 mW He-Ne laser, 633 nm wavelength and 90°C fixed scattering angle. The stability of prepared precursors was also determined by Zeta potential using the same instrument.

Powders were prepared by drying each precursor at room temperature for 72 h under a fume cupboard with no special atmosphere.

Powders were also characterized in microstructure using a scanning electron microscope FE-SEM JEOL 6340, thermal analysis using simultaneous differential thermal analysis apparatus TA-SDTQ600, with a heating rate of

5°C/min in air, chemical composition by Fourier transform infrared spectroscopy (FTIR) analysis using a Bruker Optics Tensor 27 analyser in the region 500–4000 cm^{-1}, and specific surface area by nitrogen absorption, from Brunauer-Emmett-Teller equation (BET) at 77.3K using a MicromeriticsTristar 3000 analyzer.

Pore volume and pore area of alumina and silica gel were determined by mercury porosimeter: Autopore II 9220 from Micromeritics.

The analysis of methylene blue or phenol in the effluentwas performed after a 24 h run time for the experiments involving the use of silica gel or alumina, and after 4 h for the rest of the experiments.

The reactor was a Pyrex tube of 2.8 cm inner diameter, fitted with needle-plate electrodes having a 2.5 cm inter-electrode gap.

The upper photo (Fig. 2) shows the whole system for plasma jet production, which consists of a compact VHF transmitter for the automobile (IC-207D, Icom Inc., Japan: frequency range; 144–146MHz, maximum output; 50W), a hand-made matching network in a small aluminium box and a miniaturized plasma source chip.

First, in order to examine the temperature rise of the plasma source chip due to the large electric current flowing through the antenna, thermographs of operated chips were recorded with a thermal imaging system (ThermaCAM CPA-1000, FLIR Systems, Inc., USA).

In certain cases a multichannel spectrometer (MCPD-7000, Otsuka Denshi, Inc., Japan) was used to obtain the rapid scan of the emission spectra.

The experimental set-up has been described in detail in [4] and only a brief description is provided here, focusing on the elements that are necessary for the discussion of the characteristics of the plasma.

However, it was observed that most of the current draw took place when the voltage reached its peak value.

Then, the solution was acidified by adding 1M H2SO4 and the liberated iodine was titrated against standardizedNa2S2O3 solution (0.005mol l^{-1}).

17. Read the description of a set-up, mind grammar constructions used.

Figure 1 schematically shows the experimental set-up for the studies of surface barrier discharge at atmospheric pressure. The discharge system is placed in a cylindrical chamber made of quartz glass. The flowrate of theworking gaseswasmeasured using a flowmeter. A sinusoidal voltage up to several tens of kilovolts peak-to-peak was applied to the electrodes, and the source frequency was varied in the range 1–20 kHz. The current and voltage waveforms were recorded in a digital oscilloscope (Tektronics TDS220). For OES measurements, the light emitted by the discharge is focused onto the entrance slit of a WGD-8 monochromator (focus = 500mm, resolution = 0.05 nm, scan scope is 200–800 nm) and detected by a photomultiplier tube. The output of the photomultiplier tube is amplified and transferred to a personal computer with an A/D-converter.[30]

18. Read and translate the description of plasma devices fabrication. Why was it made?

The process sequence of the plasma source chip is illustrated in Fig. 1. Two dielectric materials of alumina and quartz were examined as a chip substrate. The chip consisted of two dielectric plates with 15 × 30mm^2 area. A discharge tube with the dimensions 1×1×30mm^3 (h/w/l) was mechanically engraved on one side of the dielectric plate and a planar antenna was fabricated on the other side of the plate by the following process. The antenna pattern was masked negatively by photolithography, followed by the sequential deposition of a Cr adhesion layer of 50 nm thickness and a Cu seed layer of 100 nm thickness using magnetron sputtering. Subsequently, a Cr–Cu layer with the antenna

[30]Zhang R. et al (2003)

shape was formed using a lift-off process, and then a Cu film with 50–200μm thickness was deposited using electroplating. The dielectric plate thickness between the antenna and the plasma could be changed by selecting the thickness of substrates. Unless otherwise stated, the substrate thickness was 2mm, i.e. the dielectric thickness between the antenna and the plasma was 1mm. Finally, the discharge tube was sealed by bonding the processed plate with the other dielectric plate with 1mm thickness. As seen in the figure, the antenna pattern was formed near the edge of the chip so as to make plasma jets as long as possible.[31]

19. Read extracts from two experimental parts to compare their style, grammar constructions and structures. Give your opinion on the descriptions of the following experimental parts. Speak on the algorithms used. Suggest the changes in sentences you dislike.

A. *The constants of protolytic equilibria glycylglycine and constants stability of its complexes with nickel (II) were determined by potentiometric method with using a pair of glass and silver-chloride electrodes in aqueous-ethanol solutions in the composition range from 0.00 until 0.55 mol.% EtOH at ionic strength 0.1 M ($NaClO_4$) and T=298K. The solution of silver-chloride electrode was prepared on the basis of aqueous-ethanol solvent of the same composition for reduce the diffusion potential at the ends of the electrolytic bridge.*

The stability constants of glycylglycine complexes of nickel (II) were determined by potentiometric titration with a solution containing $Ni(ClO_4)_2$ (8.3×10^{-3}mol/l) and $HClO_4$ (4.0×10^{-3}mol/l) with using sodium of glycylglycine (8.0×10^{-1}mol/l). The constants of acid dissociation of glycylglycine were determined by potentiometric titration of perchloric acid (5×10^{-3}mol/l) by solution of

[31]Takanori I. et al (2003)

sodium glycylglycinate (7×10^{-2}mol/l). The titrant was dosed by weight through a microsyringe.

The constants of acid dissociation of glycylglycinium ion were determined by measuring pH of the dipeptide solutions, which were half neutralized by perchloric acid.

Glycylglycine (the firm "Fluka"), perchloric acid (chemically pure grade), sodium hydroxide (chemically pure grade), recrystallized sodium perchloric were used. Ethanol was purified by distillation at atmospheric pressure; the residual amount of water in the azeotrope into account at preparing solutions.

To calculate the equilibrium constants of reactions from experimental data on a computer we used a program PH METER. The calculated values of dissociation constants of glycylglycinium ion (pK_1) and glycylglycine (pK_2) were used in the calculation of stability constants of nickel complexes with glycylglycine.

B. *The complexes of Zn(acacen) and Zn(saloph) were preparated in Chemical Department of LomonosovMoscow State University. The purity of compound was proved by elemental analysis for the metal, IR spectroscopy, and mass spectrometry.*

Research of steams Zn (acacen) and Zn (saloph) was spent on a complex electronograph - mass spectrometer, created in laboratory of molecular parametresIvanovo State University of Chemistry and Technology.

The gas-phase electron diffraction patterns and the mass spectra were recorded simultaneously. The complexes of Zn(acacen) and Zn(saloph) was evaporated from molybdenum effusion cells at T=503 (5) K and T=626 (5) K, respectively. The size of a nozzle of a cell is equal 0.6/1.6 mm (diameter/length); the relation of the area of evaporation to the area effusion hole area was about

500. The cell temperature was measured tungsten-rhenium by thermocouple VR-5/20. The accelerating voltage was 79 sV. A vacuum of ~3·10^{-6} mm Hg was maintained in the diffraction chamber during the experiment.

The optical densities of exposed films (Kodak SO-163) were recorded for two nozzle-to-plate distances: L1= 598 mm and L2= 338 mm. Six electron diffraction patterns of the substance and two electron diffraction patterns of the ZnO crystal standard were obtained for each camera distance. The patterns of ZnOwere recorded before and after the electron diffraction measurements for the substance to control the stability of the electron wavelength.

The gas-phase electron diffraction patterns were scanned on a computer controlled microphotomete with a step of 0.1 mm along the diagonal of the plate. A 10×130 mm2 area was scanned; the number of equidistant scan lines was 33. The total intensity curves were obtained in the ranges s = 1.4-15.9 Å^{-1} and s = 2.4-27.0 Å^{-1} for Zn(acacen) and s = 1.4-15.9 Å^{-1} and s = 2.4-27.0 Å^{-1} for Zn(saloph), respectively.

Quantum chemical calculations of structure and force field of molecules Zn(acacen) and Zn(saloph) were carried out to estimate the starting values of geometrical parameters and amplitudes of fluctuations in the MNK-ANALYSIS of experimental function of the resulted molecular making intensity of dispersion sM(s). The theory method функционала density (DFT) with hybrid функционалом B3LYP has been used. Calculations were carried out with two basic sets: 6-31G - full-electron two-exponential basis with addition of polarizing functions on all heavy atoms and basis which is designated as CEP, TZV. Quantum chemical calculations were spent by basis under programs GAUSSIAN 03 and GAMESS.*

Structural analysis Zn(saloph)

Molecular model of Cs-symmetry was assumed throughout the GED refinements. The structure of the Cs – model was described by 42 independent

parameters. In order to diminish the correlation the number of independent parameters was decreased by following simplifying assumptions: 1) the difference between the bond distances and also the valence angles of the same type can be taken from the results of the quantum chemical calculations and can be fixed in LS analysis; 2) the phenyl rings were considered planar. Finally the six bond distances: Zn-N, Zn-O, N2-C6, C14-C16, O4-C14, C8-H28; the nine angles: NZnN, OZnO, N3N2C6, ZnN2C12, N2O4C14, O4C14C16, C8C6C7, C18C16C14, H28C8C10 and the three torsion angles: (C6N2N3Zn), (C12N2ZnC6), (C8C6C7N3) were refined in LS analysis. The structural refinement was performed in terms of geometrically consistent r_{h1}*- structure. Starting values for independent parameters and force field for calculations of root-mean-square vibrational amplitudes and also vibrational corrections to internuclear distances were taken from the DFT computations mentioned above. The amplitudes were refined in groups corresponding to the different peaks on the radial distribution curve. The least-square analysis was performed using a modified version of the KCED 35 program.*

Задания для самостоятельного анализа и пересказа экспериментальной части оригинального источника:

1. State the objective of the investigation undertaken.
2. Give the names of chemical reagents, their grade quality and suppliers of them.
3. Speak on the preparation of sols, different media, mixtures, solutions, powders; conditions of fixing and storing, cooling and drying.
4. Give an example of a successful established route of synthesizing the desired compound.

5. Explain why it was necessary to modify it.

6. Give a description of an experimental set-up using the scheme attached

7. Name the methods and equipment used to determine characteristic properties, important effects, observed mechanisms, proceeded reactions, phase composition and crystallite size, spectra.

8. What arguments do the authors present to explain the choice of the methods? How do they support every stage of the procedures described?

9. Involve equation system; explain what parameters were found with their help.

10. Describe theoretical computations strategy; name main basis sets and program packages used.

11. Say in what way is this part close and interesting for you.

Compose ***Experimental*** for your future scientific paper. Prepare a draft version of it:divide this part into Materials and Methods, Characterization, Measurements, Data collection and analysis. Do not forget to use past simple tense and **passive constructions**; do not use tautology; diversify your vocabulary.

Some useful verbsto be used are given below: carry out, make, prepare, use, purchase, adjust, supply, produce, fabricate, perform, develop, form, investigate

РАЗДЕЛ 4. РЕЗУЛЬТАТЫ

However beautiful the strategy,
you should occasionally look at the results.
WinstonChurchill (1874-1965)

В задачи данного раздела входитпредставление ключевых результатов исследования с соответствующей иллюстрацией полученных данных. Интерпретация их конкретных значений сюда не попадает. Результаты,как правило, сводятся воедино и систематизируются, параллельно выделяются и описываются важные тенденции или закономерности. Поскольку результаты представляют новое знание, отражать их следует четко и предельно просто, избегая многословия. Обычно все отобранные для печати результаты анализируются с точки зрения того, как наиболее выгоднее и нагляднее их представить.Использование самых разных типов иллюстраций и описание методологии должны быть также направлены на полноценное представление результатов исследования.

Строгие таблицы и четкие рисунки являются мощным визуальным средством представления результатов и дополняют текст раздела, но в то же время легко читаются самостоятельно. Лишь в исключительных случаях данные, сведенные в таблицы и рисунки, повторяются в текстовом сопровождении для особого акцентирования внимания на них.Результаты приводятся в четкой последовательности разработанной схеме и в соответствии с экспериментальной частью:каждому результату должен соответствовать свой метод из раздела *Методы*. Внедрение в текст таблиц и рисунков также осуществляется по определенной схеме.

Цель раздела – объективно представить и описать данные, сведенные в рисунки и таблицы. У потенциального читателяпри этом появляется возможность самому интерпретировать полученные результаты, прежде чем познакомиться с вашими рассуждениями по этому поводу в следующем разделе *Обсуждение*. Помните, в экспериментальной части показывается, **КАК** данные собирались, в *Результатах* отражается преимущественно то, **КАКИЕ** результаты получены. *Результаты* отличаются от раздела *Обсуждение* тем, что только приводят их, тогда как интерпретации и толкованию полученных фактов и явлений посвящен следующий раздел.

При построении данной части академической статьивыделяются некоторые обязательные составляющие. Прежде всего, дается краткое описание эксперимента и его логическое обоснование, приводятся релевантные данные и описательный текст для отдельных вычислений, демонстрируются таблицы или графики для периодически повторяющихся вычислений, освещаются данные в соответствии с методами, с помощью которых раскрываются вопросы, заявленные во *Введении*.

Говоря о структуре раздела *Results*следует помнить, что в нем можно вычленить три основныхформата в зависимости от типа анализируемой информации [8]. Прежде всего, выделяется описательная часть в виде текстового сопровождения (сам **текст**, представляющий результаты) и иллюстративная часть, приводящая численные данные с помощью таблиц (**табличный материал**), а наблюдения представлены как рисунки и графики (**графический материал**). Все три части выстраиваются в логической последовательности, чтобы привлечь внимание к вопросам, выдвинутым во *Введении* в качестве гипотезы. Из приведенного текстового корпуса легко определяется весь объем данных, полученных во время наблюдений,однако повторения информации, включенной в таблицы или

графики, следует избегать. Текст должен лишь дополнять наглядное восприятие графического материала. Результаты выстраивают таким образом, чтобы они подтверждали доказываемую гипотезу. Очень важно осветить результаты, наиболее уместные при ответе на вопрос, с какой целью было предпринято исследование. Вербальная оценка приводимых итогов исследования, как правило, свойственна при рассмотрении более общих положений и обнаруженных значений. Таблицыи рисунки (а также фотографии, чертежи, графики, блок-схемы, диаграммы и пр.) часто используются, чтобы сосредоточиться на конкретных деталях и подробностях исследования. Рисунки и таблицы упоминаются в тексте и приводятся сразу же после него.

Каждый параграф начинается ключевым развернутым предложением, в котором объясняется, для решения какого вопроса проводились описываемые здесь эксперименты.

Для наглядности вновь обратимся к конкретным примерам и рассмотрим фрагменты из академическихисточников [32].

The intact enzyme G1 was found to digest starch approximately 80 times faster than G2, which lacks the starch-binding domain (SBD), in agreement with previous results. When SBD was added to the starch under a wide range of G1/SBD ratios, it was only possible to observe a reduction in the hydrolytic rate of G1 with increasing amounts of SBD (Fig. 2).

However, when the effect of SBD in trans was tested using G2, it was found that low concentrations of SBD gave an increase in hydrolytic rate. At higher concentrations of SBD it produced a reduction in rate (Fig. 3). *The maximum increase in rate was just over 50% and both the increase in rate and the subsequent decrease at higher SBD concentration were statistically highly significant using the Student's t-test.*

[32]Southall S. et al (1999)

В данном случае читатель получает информацию о том, какие вещества (*ферменты; домен, связывающий крахмал*) и параметры (*концентрация, скорость поглощения, гидролитический показатель*) подвергались исследованию. Приводится значение максимального увеличения скорости гидролиза и прослеживается четкая зависимость этого параметра от концентрации анализируемого вещества. С помощью полученных данных читатель сумеетопределить задачу, стоящую перед исследователями на этом этапе. Здесь отсутствует подробное описание приводимых рисунков, вместо чего подчеркивается важность обнаруженных результатов: снижение гидролитического показателя с ростом массы крахмал-связывающего домена и зависимость первого от концентрации второго. Рисунки только зрительно подкрепляют полученное читателем новое для него знание.

Приведем для сравнения еще одну выдержку из рассматриваемого разделадругой статьи[33].

Typical NMR spectra of water are presented in Figure 1, where the temperature was raised to 600°C and then decreased, all at 250 bar. Small quantities of benzene (B) and cyclohexane (CH) were present to serve as internal references of chemical shift. The concentrations of the solutes are best determined from the ratios of intensities (areas) in Figure 1, keeping in mind the numbers of hydrogens per molecule. The large temperature gradient along the ceramic sample vessel results in a nonuniform distribution of the solute throughout the vessel. The increasing solubilities of benzene and cyclohexane at elevated temperatures lead to the increasing solute concentrations apparent in Figure 1.

В этом случае авторы в хронологическом порядке описывают проделанную работу: они обнаружили новые спектральные

[33]Hoffmann M., Couradi M. (1997)

характеристики, сопоставили их с внутренними эталонами, осуществили ряд наблюдений и пришли к некоторым умозаключениям. Внимание читателя с первых же строк приковывается к рисункам, в связи с чем ему приходится сначала самомупроанализировать увиденное, и лишь затем обратиться к тексту за подтверждением. То главное из показанных авторами результатов, что должно остаться в памяти читателя, оказывается второстепенным из-за смещения акцента в сторону иллюстративного материала. Какими бы ценными ни оказались результаты, рисунки и таблицы не должны доминировать над текстовым форматом описываемого материала.

При написаниираздела академической статьи, предъявляемогоосновные итоги исследования, следует учитывать следующие моменты.Прежде всего, необходимо четко определить, какие результаты попадут в этот раздел и насколько они релевантныдля вопросов, заявленных во *Введении*, независимо от того, подтверждают ли они выдвинутую гипотезу. Однако не следует включать все без исключения полученные результаты.Размещать данные можно либо в хронологической последовательности в полном соответствии с экспериментальным разделом, либо рассматривая их, начиная с самых существенных. В таком случае, внутри каждого параграфа следует соблюдать порядок представления материала по принципуот самого главного к наименее важному аспекту.

Продумайте, в каком виде наиболее выгодно и наглядно представить в тексте полученные результаты: в текстовом или иллюстративном формате, то есть в качестве рисунков, графиков, таблиц и пр.Систематизируйте приводимые данные и сориентируйте читателя на самых весомых и значимых данных, представленных во всех трех форматах. Однако не забывайте, что функция текста – **дополнять** рисунки

или таблицы, но не повторять ту же самую информацию.Описывая результаты, используйте исключительно **простое прошедшее** время и тот же порядок изложения, что в разделах *Материалы* и *Методы*.Каждый рисунок и таблица непременно снабжаются заголовком. Легенды к таблицам приводятся над ними, а подписи к рисункам внизу. Обратите особое внимание на то, чтобы любой сопроводительный наглядный материал легко читался, вне зависимости от текстового сопровождения. Цель каждой иллюстрации должна быть прописана в соответствующем ключевом предложении.Писать следует точно, кратко и ясно; иными словами, нужно *keepitshortandsimple*.

Таким образом, структурные разделы *Экспериментальный* и *Результаты* должны очень четко соотноситься: результаты следует представлять исключительно в логической последовательности и сосредоточиваться на вопросах или гипотезах, сформулированных в самом начале статьи.

Есть определенные моменты, которые настоятельно рекомендуется избегать при написании данного раздела научной статьи. Во-первых, не следует излишне многословно привлекать внимание потенциального читателя к иллюстрациям, включая фразы типа *Figure 1 clearlyshowsthat*…, преувеличивая тем самым полученные результаты. Не стоит упоминать несущественные результаты, хотя в некоторых случаях полезно приводить данные по экспериментам, которые оказались не совсем удачными. Не используйте дополнительные визуальные средства (например, подзаголовки к легендам и подписям), а также многочисленные неуместные иллюстративные материалы. Полученные результаты представляются в иллюстративном виде исключительно для наглядности их предъявления. Все они непременно должны быть самоочевидными, не требовать дополнительных объяснений, обладать качествами четкости и

ясности. Грамотно составленная и презентованная иллюстрация сразу же захватит внимание и останется в умах читателей. Пусть таблицы и рисунки говорят сами за себя, не требуя обращения к их описанию, которое лишь организует принцип подачи данных.

Сведем в таблицу основную информацию, необходимую для написания данного раздела.

Таблица 4.

Структурные компоненты раздела *Результаты*

Структурная единица	Содержание
Параграф 1. Ключевые вопросы и гипотеза, требующие подтверждения	Краткоеобъяснение эксперимента без подробностей из раздела *Материалы*(для каждого этапа, процедуры и метода)
Параграф 2. Что было обнаружено в проведенном исследовании?	Представлениеосновных результатов в трех форматах с акцентированием внимания читателя на наиболее значимых и существенных. Каждый абзац начинается с ключевого предложения, объясняющего задачу описываемого этапа и цель приводимых наглядных данных.
Параграф 3. Преимущества проведенного исследования	Сравнение данных с полученными ранее, имеющимися в распоряжении автора. Краткое заключение по каждому приводимому результату.
Параграф 4. Резюмирование	Сжатые обобщения; объяснения по поводу соотнесенности табличных и графических изображений; выявление их связи с выдвинутой исследовательской гипотезой.

Полученные результаты обыкновенно приводятся в следующем виде: отношения, уравнения и формулы (***relations, equations***и***formulas***); таблицы (***tables***); схемы или чертежи (***schemes***); столбчатые диаграммы (***barcharts***); макеты или модели молекул (***molecularmodels***); диаграммы, графики, схемы (***diagrams,graphs, plots***); изображения, полученные с помощью сканирующего электронного микроскопа (**SEM*images***); гистограммы (***histograms***); точечные графики (**XY*scatterplots***), линейные диаграммы (**XY*linegraphs***); фотографии (***photographs***); чертежи (***drawings***); графики, структурные схемы (***flowdiagrams***).

В таблицах обычно приводятся колонки цифровых значений, причем каждыйстолбик имеет свое название. Таблицы не используются для обозначения закономерностей или типа обнаруженной связи между набором значений.

Типичная схема табличного предъявления данных представлена ниже[34].Название таблицы (***tablelegend***) всегда указывается над ней под определенным порядковым номером. Каждая графа таблицы имеет свое название (***columntitles***) и разделяется одна от другой демаркационными линиями. Все дополнительные сведения, важные для потенциального читателя, приводятся под таблицей в виде подстрочных замечаний (***footnotes***) со знаком «звездочка». Основной корпус данных (***tablebody***) занимает центральную часть таблицы.

Рисунки чаще всего применяются для визуализации результатов. Термин «рисунки» является в данном случае обобщающим, так как графики, диаграммы, фотографии, схемы, чертежи, карты и пр. также входят в эту категорию именования наглядных материалов. Наиболее

[34]См. также:*Almost everything you wanted to know about making tables and figures*. URL: http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWtablefigs.html

распространенным типом рисунка являются графики, ярко демонстрирующие общие принципы и закономерности, а также частные виды отношений. При расшифровке графиков не стоит загромождать текст предложениями типа «На рис. 5 видно, что…».

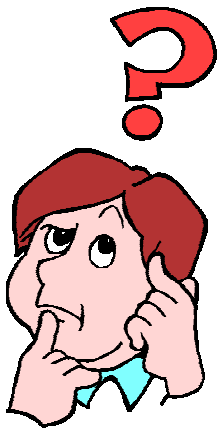
На любом графике имеются две оси: ось икс (***X axis***) и ось игрек (***Yaxis***) с обозначением соответствующих параметров измерения (***X axislabel***). На обеих осях видны основные (***majorticks***) и вспомогательные (***minorticks***) деления шкалы. Начальная точка координат называется ***origin***. Данные, как правило, представлены в виде кривых (***curves***), для каждой из которых имеется собственное обозначение (***keytosymbols***). Название рисунка обычно (***figurelegend***) приводится под ним.

Для представления результатов сравнения одного переменного на нескольких группах данных нередко используются горизонтальные или вертикальные разноцветные столбиковые диаграммы, или гистограммы (***barchart, bargraph, histogram***). Однако представление найденных параметров в виде таблиц предпочтительнее.

Точечные графики (***scatterplots***) применяются для обозначения рассматриваемых данных в рамках двух переменных величин. Построение графиков подобного рода преследует цель показать, имеется ли связь между исследуемыми параметрами и насколько согласованно они изменяются.

На линейных диаграммах (***linegraphs***) вычерчивается график для нескольких значений, чтобы описать изменения параметра Y как функции от X.

ВОПРОСЫИЗАДАНИЯ



1. State the purpose of the section*Results*.
2. Describe the structure of this section. Enumerate guidelines to be remembered.
3. Find examples of brief descriptions of the experiment or rationale at the beginning of each subsection. Pay attention to the topic sentences. Find sentences with the constructions *in order to…* and *as a result we found that…*
4. Give an example of presenting the data obtained.
5. Find examples of how the authors draw the reader's attention to illustrations.
6. **Read the beginning extract from the paper written by the British scientists. Guess the title of the paper, introduce key words, state the purpose of the investigation undertaken. Name the methods and reagents used.**

Reduction of the mononuclear Pd(II) IMes complex [Pd(IMes)$_2$Cl$_2$] with potassium graphite in the presence of 1 atm of CO at 70°C for 16 h afforded the Pd(0) trimer [Pd$_3$(l-CO)$_3$(IMes)$_3$] (1, Scheme 1), which was isolated as a deep red, microcrystalline solid in 38% yield. The ^{1}H NMR spectrum was consistent with the molecule having high symmetry on the grounds of there being only two methyl signals (in a 1:2 ratio) at δ 2.34 and 2.04. The ^{13}C{1H} spectrum showed two characteristic high frequency resonances at δ 249.2 and 198.8, which were assigned to Pd–CO and Pd–C$_{NHC}$ on the basis of a ^{13}C–^{1}H HMBC correlation from the lower frequency signal to the backbone IMes protons. The IR spectrum of 1 (recorded in C$_6$D$_6$) showed a single band in the bridging carbonyl region at 1796 cm^{-1}, significantly lower in frequency than reported for [Pd$_3$(μ-CO)$_3$(PPh$_3$)$_3$] (1850 cm^{-1}), consistent with the strong σ-donor power of NHCs.

A similar reaction of the N-alkyl Pd(II) precursor [Pd(I^iPr_2)$_2Cl_2$] (2) with KC_8/CO afforded the analogous N-isopropyl substituted trimer [Pd_3(μ-CO)$_3$(I^iPr2)3](3, Scheme 1), which due to its low stability (the compound had to be maintained under a CO atmosphere in solution, or rapidly turned black) could only be isolated in very low (ca. 5%) yield. As for 1, the spectroscopic properties of 3 (a single set of N-^{i}Pr proton resonances and a single low frequency (1793cm^{-1}) carbonyl infra-red stretch) were indicative of a highly symmetrical molecule.[35]

7. **Read the section *Results* written by the American scientists. Do you consider the first sentence as the topic one? Paraphrase the following extract.**

The radial distribution function comparing GCPM and CPMD is shown in Fig. 6. Due to the small number of water molecules, the CPMD results do not extend beyond the second water shell. The agreement of the CPMD results with GCPM results is very good; the latter in turn are in very good agreement with experiments. Note that CPMD predicts slightly enhanced structures (indicated by higher peaks) for water than GCPM, consistent with our discussion in Sec. II — that is, we expect CPMD to overpredict structure slightly compared to experiment.

As can be seen from Fig. 7, the degree of the hydrogen bonding in GCPM water is similar to that calculated via CPMD. CPMD predicts a slightly more structured fluid as the temperature decreases, shown by a higher degree of hydrogen bonding. This is consistent with our remarks in Sec. II above concerning CPMD, in that we expect it to have a higher degree of hydrogen bonding compared to experiment.[36]

[35]Camur M., Bulut M. (2010)
[36]Dyer P., Cummings P. (2006)

8. **What do you think about such the beginning of the *Results* part? Give your comments and critique.**

It was reconfirmed that α-alanine has a neutral form in the gas phase. The geometrical molecular parameters obtained in the least-squares analysis are listed in Table 2 as the values at the vibrational ground state, r_α^0. The limits of error in the distances were taken to be the square root of the sum of the squares of the random and systematic errors, while those in the angles were taken to be the random errors. The random errors were assumed to be 2.6 times as large as the standard errors in the least-squares calculations. The systematic errors were estimated from the errors in the camera distances (0.03%) and the wavelength (0.05%). The best-fit molecular intensities and the radial distribution curve are shown in Figs. 2 and 3 as solid curves, respectively. The observed rotational constants B_o, the corrected ones for the vibrational effects, B_z, and the calculated ones obtained from the refinement, B_α^0calculated are listed in Table 3.[37]

9. **What information is presented below? Is it suitable to the *Results* part? Could you suggest any changes?**

The "peapod" structures were prepared by a diffusion of C_{60} molecules inside the preliminary purified single wall carbon nanotubes (SWNTs) with opened ends at 420^{o}C in an evacuated (10^{-6}Torr) and sealed glass ampoule. SWNTs were first subjected to selective oxidation to remove amorphous carbon, which covers the SWNTs and the metal catalyst particles, followed by refluxing of nitric acid, which digests the residual metal and opens the tube ends; it also creates defects or a hole on the sidewall of SWNTs. With the opening of the nanotube ends, and the creation of the hole in the nanotube wall, the internal pore or channel is accessible to foreign materials such as C_{60}.[38]

[37]Iijima K., Nakano M. (1999)
[38]Harutyunyan A. et al (2002)

10. **Paraphrase the following sentences focusing attention to the results obtained.**

Table 5 lists the obtained structural parameters of the A/(eq, eq, syn) conformer. Figure 3 illustrates the definitions of the methyl out-of-plane angle α, and the puckering angle β, of the pyrrolidine ring. An experimental radial distribution curve with residuals is shown in Figure 4.

11. **Read the following extract form the Results part. Give your comments and critique on it.**

To provide a reliable template to construct a nAChR model, it should be the best to determine the in vivo structures of agonists. However, there is no practical experimental method to obtain molecular structures in aqueous solutions, and it can be said that the gas-phase structures provide the best substitutes for them. This is because the gas-phase structures are free from the packing effect of solids that sometimes changes the molecular structure significantly.[39]

12. **Read and give your opinion on the beginning of Pakistani scientists' paper.**

In this work we have compared the rate of decolourization of methylene blue for:

(a) pulsed corona discharge in the solution,

(b) pulsed corona discharge with O_2 bubbling and

(c) pulsed corona discharge with bubbling of O_2 containing 1500μmol O3 l^{-1}.

The changes in concentration, pH and conductivity of methylene blue solution with treatment time for the conditions (a)–(c) are given in table 1. Under the condition (a) the streamers appeared to be around 2 cm in length. Occasionally, the streamers could touch the counter electrode thus bridging the

[39]TakeshimaT. et al (2002)

gap and changing the streamer discharge into a spark discharge. A photograph of the streamer discharges in water is illustrated in figure 3. Multiple streamers and a few spark discharges with bright appearance were recorded in the photograph. With progress of reaction the streamer length appeared to decrease reaching <0.5 cm after 120 min. The streamer length is dependent on solution conductivity. At the beginning of the experiments the solution conductivity was 16.8μScm^{-1} and it increased to 100.0μScm^{-1}, which causes the observed reduction in streamer length. Under the conditions (b) and (c) the discharge took place inside a gas bubble making them appear bright. Occasionally, streamers in the liquid were also observed. Some of the gas bubbles appeared to disintegrate into many micro-bubbles.

The results given in table 1 show that the conductivity of the solution treated by corona discharges (condition (a)) is higher than that of corona discharges with O_2 bubbling (condition (b)) or corona discharges with O_2 containing O_3 (condition (c)). Further, UV spectra of the sample treated under condition (a) show strong absorption near 200 nm, which is reduced under condition (b) and reduced further under condition (c), as illustrated in figure 5. Increase in the conductivity and the absorption near 200 nm may be due to accumulation of corona discharge products, such as H_2O_2, O_3, etc, or the intermediates of methylene blue decomposition. No attempt was made to identify the byproducts in the present work. However, the results show that the treated water is purer under condition (c) than under condition (b) and least pure under condition (a).[40]

13. **Paraphrase the sentence highlighting the dependence observed.**

Figure 9 shows the gas flow rate dependence of plasma density and electronic excitation temperature of Ar atoms measured at 2mm away from the antenna edge.

[40]Malik M. et al (2002)

14. **Name the main results obtained by the Pakistani scientist in his research. What do you think may be changed?**

Typical voltage and current waveforms of pulsed corona discharges in aqueous solution of methylene blue (13.25mg litre^{-1}) are shown in Fig. 2. The peak voltage of the pulse was around 40 kV with a rise time of around 50 ns. The total duration of the voltage pulse was in tens of microseconds with a repetition rate of about 60 pulses per second. The maximum current was around 240A. The corona power (VI) is the product of the measured voltage and current, and energy delivered per pulse is the time integral of this product. Energy per pulse was calculated to be 0.036 J. The input power was 2.2W for 60 pulses per second in this experiments.[41]

15. **Characterize the following extract. What information is given here? What in your opinion should be changed?**

A solution containing 13.25mg litre^{-1} methylene blue was passed through the reactor packed with fresh silica gel and in the absence of corona discharge and ozone. Methylene blue in the effluent gradually increased from a very low value to around 2.5mg litre^{-1} in 6 h, as illustrated in figure 5. At this stage, the excess solution was drained out from the reactor and the silica gel beads were washed with distilled water. The beads were dark blue in appearance. A few beads were broken and examined under the microscope. A dark blue coloured layer of around 50μm thickness was present on the outer surface of the beads while the inner portion of the beads was transparent white without any traces of methylene blue. Mercury porosimetric analysis of the silica gel revealed that it had low porosity (0.0035 cm^3 g^{-1} pore volume, 23.3m^2 g^{-1} surface area) and a negligible fraction of macropores (figure 6). The absence of macropores explains the absence of methylene blue in the inner region of the beads.

[41]Malik M. (2003)

Macropores in adsorbents provide fast access to the inner portions. It is desirable to study the plasmacatalytic effect of macroporous silica gel beads.[42]

16. **Give your comments on the beginning of the *Results* section. Criticize the opening sentences. What would you like to change?**

The paper provides a comparison between five major candidates for the role of conductivity enhancement in the cathodes of alkaline batteries. These types are as follows:

1. Synthetic graphite;

2. Thermally purified natural flake graphite;

3. Chemically upgraded natural flake graphite;

4. Purified expanded graphite;

5. Acetylene black.

The paper will provide an in-depth comparison between the properties of chemically and thermally purified flake graphite. Residual sulfur, halogen and ash in the chemically upgraded graphite may be potential poisons for batteries with KOH electrolyte. The neutralization reactions between the electrolyte and residual acid on the basal plane edge of graphite may catalyze self-discharge reactions in batteries. They are believed to shorten the calendar life and cause gassing. Also, we will show that thermally purified natural graphite is now available in high purity, and unique morphology, which allow it to successfully outperform conventional high quality synthetic graphite. The example of Superior's newly developed natural graphite grade Formula BT 2939APH has been observed to offer competitive electrochemical performance to the high quality synthetic graphite of similar size distribution (see Fig. 1). Extensive studies indicate that 2939APH may be used alone for application in all standard alkaline battery sizes of the base performance, including AA, AAA, 9V, C and D.

[42]Malik M. (2003)

This is currently not the case with synthetic graphite where only certain synthetic graphite size distributions are applicable to certain sizes of batteries.[43]

17. **What do you think about such a beginning of the *Results* part of a paper? What would you like to change?**

Before 1995, the material of choice for the conductivity enhancement of EMD/CMD electrodes was high quality synthetic graphite, having purity of 99.9% C. The two other alternatives, which existed at that time, namely, natural graphite and acetylene black, represented inferior candidates. Natural graphite technology was not capable of manufacturing specially ground high purity graphite (impurities decrease efficiency of the conductivity enhancement process and may catalyze side reactions, which are responsible for self discharge and gassing in cells). Acetylene black, due to its surface chemistry specifics, is known to chemically reduce EMD and thus shorten the shelf life of a battery. Also, it represents processing challenges due to the difficulty in compacting EMD/carbon/binder cathodes.[44]

18. **Do you think this passage correspond to the *Results* section? Give your arguments.**

The manganese analogue of 9 was prepared from an in situ reaction of $PhCH_2Mn(CO)_5$, diphenylazabutadiene and PhCCH and was assumed to involve the intermediacy of the cyclometallated compound 1, which was not directly observed. The isolation of the rhenium complex 9 from a cyclometallated precursor under comparable conditions supports this previously suggested pathway.[45]

19. **In what form is it most preferable to demonstrate such a result?**

Crystals of 1 and 3 suitable for X-ray crystallography were obtained from THF/hexane solutions.

[43]Barsukov I. et al (2002)
[44]Barsukov I. et al (2003)
[45]Toshie A. et al (2010)

20. **What do you think about such topic sentences? Make all possible changes to perfect them.**

We note a rather interesting result concerning the formation of the nonplanar structure of ring A (D).

The results of the calculations of the geometrical structure of the pyrrole (Fig. 2, molecule I) and 5-oxo-2-methylene-3-pyrroline (Fig. 2, molecule II) molecules are presented in Table 1.

Table 1 also contains the calculation data on the bonds lengths in the five-membered rings of molecules of the I−VIII series obtained by the AM1 method. These data appear to be somewhat more preferential than the results obtained by other semi empirical methods.

SEM micrographs of the as-produced Fe-MWCNT showed the presence of impurities in form of the amorphous structures (images not presented here). Therefore, an efficient purification treatment is required.

Figure 2 shows the time-resolved conductivity of both P3HT and P3HT:PCBM blends after photoexcitation at 800 nm, extracted using the fixed-gate method.

For inorganic semiconductors and heavily doped polymers, the Drude model of free carriers has been found to model the terahertz conductivity accurately.

At first sight, nicotine seems to have many stable conformers arising from the combination of the following sources of flexibility: pseudorotation of the pyrrolidine ring that is responsible for the envelope and twisted forms of the ring and the equatorial and axial positions of the pyridine ring; inversion around the N atom in the pyrrolidine ring that is responsible for the equatorial and axial positions of the methyl group; internal rotation around the C C bond between the rings.

21. **Read the extract from the *Results* part written by British scientists. Copy typical phrases and clichés, necessary grammar constructions. Give your comments on the stylistics used by the authors.**

Figure 4 shows the photo induced conductivity for P3HT and P3HT:PCBM films as a function of time after excitation at 800 nm, measured with the laser oscillator system at an excitation fluence roughly three orders of magnitude below that used to acquire the curves shown in Fig. 2. In order to obtain a sufficiently high signal-to-noise ratio at such low fluences using current techniques, it is inevitable that higher pulse repetition rates be used. As a result, no increase in photoconductivity is now seen at t=0ps, suggesting that the predominant species present on time averaging has a lifetime that exceeds the interpulse separation of the laser oscillator (12.5 ns) by a significant amount. For example, if we assumed for simplicity that only one species was present, which decayed exponentially, then its lifetime would need to exceed ≈100 ns in order for us not to resolve a rise near zero delay within our signal fluctuations. The long-lived nature of the species strongly suggests that the low-fluence measurements predominantly probe free charges in the material. This conclusion is supported by the fact that a significant increase (x24) in the conductivity can be observed when PCBM is added to P3HT. P3HT:PCBM photovoltaic devices are known to exhibit good external quantum efficiency, and it is therefore to be expected that the primary time-averaged photoexcited species in these materials are free charge carriers. In order to determine the terahertz signature of free charges in the polymer, the photoinduced conductivity spectrum was taken for the P3HT:PCBM film, as shown in Fig. (3b). Comparison with the data taken on the high-fluence system unambiguously confirms that, for all three types of measurement, i.e., at 1 ns after excitation below gap or above gap with high fluence, and on time-average after excitation below gap with low fluence, the predominant species causing a change in

terahertz transmission for P3HT:PCBM films are free charges. In Sec. IV we discuss further the possible charge-generation mechanisms for polymers and polymer:fullerene blends photoexcited above and below the π−π absorption edge*[46].

22. **Do you think this statement is suitable for the *Results* part? Give your arguments.**

Existence of a more than one peak is connected with the inhomogeneity of the sample (with amorphous carbon and different morphologies of carbon fibers present); this was also correlated with the microscopic measurement results.

23. **Read the following extract. Characterize it; pay attention to underlined sentences, words and expressions; suggest your changes. Comment upon the stylistics used.**

In water solution glycylglycine exists as a zwitter-ion and its characterized by two reactions of acid-base interaction:

$H_2GG^+ \leftrightarrow \quad HGG^{\pm} \quad + \quad H^+ \qquad pK_1$, *(1)*

$HGG^{\pm} \leftrightarrow \quad GG^- \quad + \quad H^+ \qquad pK_2$, *(2),*

where GG^- – glycylglycinateion, $HGG^{\pm}$ – neutralformofglycylglycine, H_2GG^+ – glycylglycinium ion.

Experimentally obtained dissociation constants pK_1 and pK_2 in water solution are in good agreement with literature data (table 1).

The equilibrium constants of reactions (1) and (2) in water-ethanol solvent are given in, but in these works less wide range of compositions of mixed solvent (till to 0.37 mole fraction of EtOH) was studied, and the constants of acid-base interactions obtained in these works differ by more than 1 log. units

[46]Parkinson P. et al (2008)

(fig. 1). It can't be used to quantify the influence of solvent on these processes and as auxiliary quantities for calculation of stability constants of nickel complexes with glycylglycine.

The constants of protolytic equilibria of glycylglycine in aqueous-ethanol solvent obtained are given in table 2.

According to it the addition of ethanol in the solution has a different effect on the shift of equilibrium reactions (1) and (2): the acid dissociation of glycylglycinium ion is worsed with increasing concentration of ethanol, the dissociation being increased. There are similar relationships in the works, and the numerical values of equilibrium constants, which obtained in this work, are the average value on the literature data (fig.1).

The nickel forms complexes with glycylglycinate ion of composition 1:1, 1:2 u 1:3:

$$Ni^{2+} + GG^{-} \leftrightarrow [NiGG]^{+} \quad \lg K_1, \qquad (3)$$

$$[NiGG]^{+} + GG^{-} \leftrightarrow [Ni(GG)_2] \quad \lg K_2, \qquad (4)$$

$$[Ni(GG)_2] + GG^{-} \leftrightarrow [Ni(GG)_3]^{-} \lg K_3, \qquad (5)$$

The stability constants of all three complexes in aqueous solutions are in good agreement with the literature data cited for comparable conditions (table 3).

Experimentally obtained values of stability constants of nickel complexes with glycylglycine in water-ethanol solvent are given in table 2.

As shown the table 2, the stability of all three nickel complexes with glycylglycine is increased with increasing concentration of ethanol in the solution.

Let us consider the ratio of reagents salvation contributions to the change in Gibbs energy of formation reaction of monoglycylglycinate complex of nickel (II) according to the salvation approach, and using the values of ΔG° transfer of

nickel ion from water into water-ethanol solvent. Lacking of data of $\Delta_t G°$ of glycylglycinate ion in water-ethanol solvent does not allow complete thermodynamic analysis. Therefore, the change of Gibbs energy of reaction (3) was presented in the form of 2 components:

$$\Delta_t G_{r1}° \underbrace{= \Delta_t G°([NiGG]^+)}_{I} - \underbrace{\Delta_t G°(GG^-)}_{II} - \Delta_t G°(Ni^{2+}) \quad (6)$$

Fig. 2 shows that the negative values of $\Delta_t G°(Ni^{2+})$ does not contribute to hardening of the complex, and the difference $\{\Delta_t G°([NiGG]^+) - \Delta_t G°(GG^-)\}$ does the main contribution to $\Delta G_r°$. It is supposed that the negative change of Gibbs energy of reaction formation of monoglycylglycinate complex with nickel is determined by a large positive value of $\Delta G°$resolvation of glycylglycinate ion.

To confirm this assumption we pay attention to the work [2], in which ...

Using the data of [20, 21] on the stability constants of nickel complexes with glycinate ion and acetate-ion in water-ethanol solvent, and the values of $\Delta G°$ salvation of glycinate and acetate ions in water-ethanol, we have determined values of difference coefficient; they're 0.63 and 0.75 respectively. Using the average value α_{dif} (0.69) and the values of $\Delta_t G_r°$, which were obtained in present work, we've evaluated value of $\Delta_t G°$ of glycylglycinate ion (GG^-) in water-ethanol solvent according to eq. (7).

The values of $\Delta G°$resolvation of glycinate and acetate-ions in water-ethanol solvent are approximately equal (fig. 3). The values of increasing of stability constants of monocomplexes nickel with glycinate and acetate ions in water-ethanol solvent are also approximately equal (0.91 and 0.78 log. units respectively). The $\Delta_t G°(GG^-)$, which was calculated is more than the $\Delta_t G°(Ac^-)$ and $\Delta_t G°(G^-)$. And therefore, the stability constants of monoglycylglycinate

complex of nickel (II) has a greater increase, probably, in water-ethanol solvent to compared with complexes of acetate and glycinate ions.

24. **Can you name the following expressions 'clichés'? Give arguments and suggest other ways for demonstrating the results obtained.**

It is possible to state for sure; it is worth noting that; are compared in Fig. 5 and 6; it needs to be noted that; is consistent with the experiment; the same relates to

25. **Familiarize with another extract. Characterize and criticize it. Speak on the structure, topic sentences, choice of lexical and grammatical means in writing.**

Vapor composition. As previously shown by mass spectrometry, the Zn(acacen) complex has high thermal stability. Thus, experiments with a double two-temperature effusion chamber made it possible to detect that in a temperature range of 270 to 600°C superheated vapors of the complex contain the only molecular form with $ZnO_2N_2C_{12}H_{18}$ stoichiometry of the initial compound. The temperature at which metal containing ions cease to be recorded in the mass spectrum and which can be characterized as the temperature of complete thermal decomposition of Zn(acacen) is 676(5)°C.

The experimental structural parameters and those calculated by the B3LYP method well agree with each other (Table 2). A difference between the basis functions in two variants of calculations almost does not change the parameters of the organic ligand: however, it affects the parameters of the coordination fragment. So, the full electron basis set for the Zn atom results in underestimating the length of Zn—N and Zn—O coordination bonds as compared to the experiment, and the use of the effective core potential for the Zn atom causes overestimation of these values.

Задания для самостоятельного анализа и пересказа части оригинального источника, освещающей полученные результаты:

1. State briefly the purpose of main procedures and experiment stages undertaken in order to prove the hypothesis.
2. Enumerate all the results given due to the methods used.
3. Give a description of conditions causing such results.
4. Compare the data obtained with those of literature and previous studies.
5. Describe synthetic routes.
6. Characterize structures, properties and spectra of complexes and compounds obtained.
7. Explain in what way the authors draw a reader's attention to the most significant findings and visuals.
8. Explain the reason the authors used every mentioned method (e. g., flash photolysis, DFT calculations, electronic spectroscopy, etc.) with the help of topic sentences.
9. Illustrate the results mentioned by describing some tables, graphs, schemes and figures.
10. State which of the results are relevant and interesting to your research.
11. Explain in what way it is possible to use these findings in your study.

Write the draft version of the *Results* section of your paper: select and organize the findings, presenteach in a separate table or chart; compose topic sentences to introduce the purpose of every table, figureand quantitative comparison; write 'bridge' sentences to orient readers about how the different results relate to one another and to the overall research question. The preferable grammar tense is also **past simple** though if it is necessary to refer to illustrations use present simple tense.

Some useful verbs to be used are given below: obtain, observe, record, compare, identify, describe, see, collect, aim, show, demonstrate

РАЗДЕЛ 5. ОБСУЖДЕНИЕ

Research consists in seeing what everyone else has seen,
but thinking what no one else has thought.
AlbertSzent-Gyorgyi (1893-1986)

Данный раздел является центральным ядром научной статьи. Именно здесь находится ответ на вопросы, прописанные во *Введении*;пространно объясняется, как процесс получения результатовспособствовал поиску решения поставленных проблем;подтверждаются факты, насколько новое знание согласуется с существующим научным мнением по этому поводу. Это ключевой раздел академической статьи, в котором автор подробно и аргументированно излагает свою позицию, дает объективную оценку

предпринятого исследования и приведенных результатов, рассуждает о возможных новых аспектах и перспективах работы и применении полученных данных.

Основная цель раздела*Обсуждение*заключается в том, чтобы интерпретироватьрассматриваемые результаты, привести определенные умозаключения и подтвердить все сделанные выводы с помощью полученных новых экспериментальных и общеизвестных знаний. Также необходимо сравнить полученные результаты с тем, что уже было обнаружено другими учеными в этой области научных интересов, без чего невозможно грамотно и полно интерпретировать собственные материалы. Особое внимание уделяется определениювесомости и важности результатов: следует отметить, были ли выявлены новые феномены и механизмы; прояснились ли некоторые тенденции; обнаружены ли новые закономерности; насколько скоординированы полученные данные с упоминавшимисяранее; какова практическая или теоретическая значимость проделанной работы. При этом чрезвычайно важно, чтобы обсуждение результатов опиралось исключительно на свидетельства, представленные в разделе *Результаты*. На них следует только ссылаться, но не повторять еще раз.

Обсуждение не должно быть слишком длинным и затянутым. С другой стороны, его особенностями являются сжатость и сконцентрированность не только на узких вопросах проведенного исследования, но и на более общих моментах, непосредственно связанных с ним. Основу данного раздела составляет освещение трех фундаментальных аспектов: подтверждение выдвинутой гипотезы; совпадение с данными других исследователей и собственные выводы.

Привлечем для подтверждения сказанного некоторые фрагменты раздела *Обсуждение* из оригинального источника, опубликованного в журнале *Atherosclerosis*.

In this study, we have shown that serum total bilirubin concentrations are inversely related to cigarette smoking. This inversed association was found to occur in individuals without coronary artery disease (CAD) as well as in individuals with minimal CAD and severe CAD. The studies also show that smoking is associated with increases in serum cholesterol, cholesterol/high-density lipoprotein (HDL)-cholesterol ratios and triglycerides and is inversely related to HDL-cholesterol and systolic blood pressure. We have previously found that serum bilirubin is decreasedin individuals with CAD. These findings have been recently confirmed in studies of subjects with early familial coronary artery disease.

Из ключевого предложения следует, что авторы выполнили основную задачу исследования, состоящую в том, чтобы охарактеризовать связь между табакокурением и общей концентрацией билирубина в сыворотке крови. Подтверждение взаимовлияния курения и сердечно-сосудистых заболеваний также нашло свое отражение в этом абзаце.

Следующий параграф описывает значимость проведенного исследования и его существенные отличия от подобных в этой области.

Our recent study of an inverse association between serum bilirubin and CAD was the first study showing that low serum bilirubin concentrations may be useful in predicting CAD.

Авторам удалось развеять миф о том, что диагностическое значение имеет только повышенная концентрация билирубина в сыворотке, что позволило выдвинуть новое предположение и направление в исследованиях:

In addition, the results of the study suggested that the low serum bilirubin concentrations could be the result of oxidative consumption … Further studies will have to be performed to determine if other antioxidants are also decreased with cigarette smoking, if serum bilirubin is an effective measure of oxidative stress and if it can be used to monitor antioxidant therapy.

Обратите внимание, что первое предложение в разделе *Обсуждение* должно быть ключевым, содержать основной вывод авторов, подтверждать выдвинутую ранее гипотезу.

The changes in chemical shift of the H_2O protons with changes in temperature and density overwhelmingly reflect the changes in hydrogen bonding.

Данный раздел, точно так же, как и все предыдущие,без особого труда структурируется и включает в себя следующую информацию.

- Указание на неординарность и нестандартность предпринятого исследования.
- Освещение и раскрытие вопросов, заявленных во *Введении*, с привлечением собственных разъяснений и уже опубликованных сведений других ученых, которые совпадают с высказываемыми предположениями.
- Объяснение результатов, не совпадающих с предложенной гипотезой; представление данных, которые имеют некоторое отклонение от ожидаемого развития и их альтернативное толкование.
- Приведение аргументированных выводов о рассматриваемых процессах, подтвержденных на основе полученных результатов. Выводы обязательно должны содержать новое понимание рассматриваемой проблемы.
- Обобщение основных моментов совпадения умозаключений с мнением других ученых; трактовка проявившихся несоответствий и несостыковок; прояснение неожиданных выявленныхданных; указание на

незначительные недостатки проведенного исследования, которые смогут повлиять на значимость работы или возможность обобщения данных.

- Формулировка ключевого вывода автора, содержащаяобобщенные рассуждения и рекомендации, определяющая их значение для теории и практики, выявляющая общественно-социальную значимость.

- Предложение способовтеоретического или практического применения полученных результатов.

- Рекомендации по поводу дальнейших исследований в данной области с кратким обозначением возможных этапов изучения и указанием на перспективы последующих разведок по теме.

Порядок изложения вышеуказанных сведений в данном случае достаточно произвольный. Тем не менее, композиционные звенья построения раздела *Обсуждение* можно свести в следующую таблицу.

Таблица 6.

Структурные компоненты раздела *Обсуждение*

Структурная единица	**Содержание**
Параграф 1. *What did the research show*?	Повторное упоминание целей и задач исследования. Информация о наиболее существенных результатах исследования. Объяснить, проливают ли полученные результаты свет на выдвинутую гипотезу и как интерпретировать эти сведения.
Параграф 2. *What are strengths and weaknesses of methods*?	Характеристика положительных и отрицательных моментов при использовании указанных методик исследования. Каждый значимый результат сопровождается освещениемпунктов: • описание выявленных моделей, принципов,

	связей; • соотнесенность с гипотезой, цитируемыми источниками и экспериментом; • альтернативная интерпретация отклонений от ожидаемого; • объяснение того, почему эти данные важны и интересны, что привлекло внимание;

Окончание Табл. 6.

	• приведение нового взгляда на рассматриваемую проблему.
Параграф3. *Did the results support other scientists' opinion or refuse current knowledge*?	Рассуждения о том, можно ли усовершенствовать методику и инструментарий; возникли ли новые вопросы, требующие дальнейшего изучения; способствуют ли полученные данные более глубокому и точному освещению существующей системы знаний в изучаемой области.
Заключительныйпараграф *What is the impact on current thinking and practice*?	Краткий емкий вывод. Определение будущих направлений исследования. Оценка собственного вклада в теорию и практику современной научной мысли.

Излишне напоминать, что изложение материалов раздела *Обсуждение* дается с помощью тех же ключевых терминов и основных глаголов в простом настоящем времени, с которых начиналось *Введение*.Можно начать раздел, четко отразив связь и соотнесенность между зависимыми и независимыми переменными, на которые указывают

полученные данные. Затем более точно показывается, почему предполагаемая гипотеза была или не была подтверждена. Наиболее частотные глаголы в данном разделе ***supported, indicated*** и ***suggested***. В данном разделе рекомендуется использовать в основном активный залог, избегать слишком пространных фраз, просто и четко излагать свою мысль. Употребление местоимения первого лица допустимо, но не следует применять его слишком часто, поскольку это лишь отвлечет читателя от основных моментов.

ВОПРОСЫИЗАДАНИЯ

1. What is the function of the Discussion section?
2. With what other sections of a paper the *Discussion* is always connected to? In what way?
3. **Read the concluding remarks from the paper of American scientists. Can this part be interpreted as *Discussion*? Speak on the structure of it, pay attention to topic sentences, mind grammar constructions.**

In this paper, new Car–Parrinello molecular dynamics (MD) results for liquid water have been reported at the BLYP level of density functional theory. For a system of 64 H_2O molecules and an 80 Ry plane-wave cutoff, excellent agreement with the most recent experimental x-ray and neutron scattering results has been obtained for the oxygen–oxygen radial distribution function. The simulation results for this system were shown to be insensitive to two different initial starting configurations, but clearly different from Car–Parrinello MD results for a smaller plane-wave cutoff (50 Ry) and somewhat

different from the Car–Parrinello MD results for a smaller system size (32 H_2O molecules). The Car–Parrinello MD results for the self-diffusion constant in the 64 H_2O and 80 Ry cutoff system were also found to be in good agreement with experiment.[47]

4. **Explain the choice of such a sentence made by the authors. Where and why can it appear in the paper?**

We expect a similar behavior to occur also for other systems and for different condensed-matter environment.

5. **Give your opinion on the topic sentence from the Discussion section in a French scientists' paper. Suggest some changes.**

Experimental (Fig. 2) and theoretical (Fig. 8) diagrams show two capacitive loops.

6. **Comment upon the topic sentences from different papers; make all the possible changes if necessary.**

In this section we aim to place the present and previous results from OPTP spectroscopy of polymeric semiconductors in the context of reported charge generation and transport mechanisms in these materials.

Plasmas are commonly classified according to the density of the charge carriers and the thermal energy (temperature) of electrons in particular. The measurement of the current density is an expression of these intrinsic properties.

Recent developments in the field of graphite purification processes allowed some grades of natural graphite and its derivatives to efficiently supplant synthetic graphite, which was commonly recommended for the conductivity enhancement applications in high quality batteries since 1960s.

[47]Zhang X. et al (2002)

In order to understand the plasma process completely, a plot of the voltage versus current characteristics are presented in figure 2. A volume of 300ml of 2 g l^{-1} Na_2SO_4*was used for the electrolysis.*

The main goal of the present work was to construct a potential-energy surface for the electronic ground state of NH_3 *that accurately covers the region up to 20 000* cm^{-1} *above equilibrium.*

In order to gain further insight into the nature of the reaction intermediates, the reaction of the hydrated electron with coumarin was studied with a weak oxidant, methyl viologen (MV^{2+}*),* $E° = -0.448V$.

To analyze whether those plasma-treated cells that survive the initial insult die through an apoptosis-like process, TUNEL assays were performed.

We observed a pronounced, time-dependent pH decrease in algal cultures, culture media and deionized water after plasma treatment (Figure 3).

Before 1995, the material of choice for the conductivity enhancement of EMD/CMD electrodes was high quality synthetic graphite, having purity of 99.9 %C. The two other alternatives, which existed at that time, namely, natural graphite and acetylene black, represented inferior candidates.

The overall reactions are summarized in Scheme 1.

In order to illustrate the features of the geometric structure of the Zn(acacen) complex let us compare the structures of two types of gaseous M(acacen) and $M(acac)_2$ *complexes, in which atoms of 3d elements have coordination number of 4 – Ni(acacen), Cu(acacen), and Zn(acacen), and biscomplexes of these metals with acetylacetonate*$M(acac)_2$.

7. **Paraphrase the sentences so that they present the perspectives of the further research.**

It seems to be reasonable to consider that the complete mechanism of copper oxidation will be able to explain the complete evolution of the frequency f_c *with the electrode potential.*

Further work on identification of byproducts, mineralization of byproducts, decomposition of other dyes and toxic organic compounds and sterilization of water is required. Energy transfer from power supply to reactor and energy efficiency of ozone generator can also be improved by further studies.

8. **Read and translate the following extract, characterize it. What part of the *Discussion* section is it?**

What other factors, if any, might contribute to the deleterious mechanism observed in the present study? A ‘‘charging effect’’ between charged particles in plasmas and the cell surface should not be directly responsible for the killing effect, because we employed ‘‘remote exposure’’ and the charged particles should be neutralized before reaching the cell surface in the aqueous media. Production of UV light should not be a significant contributor to the process, given the remote-exposure method used and the rapid attenuation of UV with depth in liquid. Temperature change associated with remote exposure is negligible. In a post-facto experiment we performed, the temperature of a water sample increase only 2°C following exposure to plasma for 5 min. The decreased pH, therefore, remains as themost plausible causative factor.[48]

9. **What piece of information is given in the following sentence? Do you think it is possible to shorten it?**

In order to quantitatively prove our assumption that EMD/CMD electrodes having the thermally purified natural graphite have lesser abrasiveness (which should cause reduced tool wear) than those incorporating synthetic graphite, we have created a new method of expedited estimation of tool wear.

[48]Tang Y. et al (2008)

10. **In what way is it possible to change the sentencesso as to avoid tautology in the text and reference to the tables?**

However, as can be seen from results of high-level theoretical calculations performed on cis- and trans-formic acid (see Table 5), the cis- form has a considerably lower total energy.

11. **The following sentences are not very thoroughly composed as they only state the type of illustrations given. Change the sentences so that they highlight the priority of results and not figures.**

Table 1 lists the characteristics (gas pressure, applied voltage and discharge current) of two classes of plasma that are close to the characteristics of the plasma generated in the PDN experiments.

*Inspection of Table V shows that our variational calculations on the (complete basis-set)CBS** -5 surface consistently overestimate the experimental term values.*

Table 3 illustrates the effect of bound and free Irgacure 2959 on the rate of photocuring with initiator concentration.

End of pulse transient absorption spectra of the 4-hydroxybenzophenone systems on the nanosecond time scale are shown in Figs. 4–6 while those for the Irgacure 2959 systems are shown in Figs. 7–12. Spectra at two time delays are shown and all the absorption data and first order kinetic rate constants for the transient decays are compiled in Table 9.

Fig. 1 represents a graph of dependence of the resistivity of a composite MnO_2/C for different ratios and types of graphite in the electrode composition.

As shown in Fig. 1 the azabutadiene has formed a five-membered cyclometallated group, coordinated through the N atom and the deprotonated C(1) atom.

12. **What do you think about such an extract from the *Discussion* section? Criticize it, give your comments.**

The chemical composition of the individual tubes filled with metal was performed with Energy dispersive X-Ray spectroscopy (EDX) analysis (Fig. 2a). The area of the analyzed sample is indicated by the square in the STEM micrograph. EDX analysis reveals that the only detected signals come from iron, carbon and copper (from TEM grid). Further confirmations of the chemical composition and profile concentration were performed using local electron energy-loss spectroscopy (EELS) (Fig. 2b). Here the investigation of the correlation of the carbon and iron signal with EELS is demonstrated. The Fe and C profiles show a clear correlation between them, while their maximum intensities are anti-correlated.[49]

13. **Reformulate the following sentences as the concluding remarks at the end of a paragraph.**

The high photo induced terahertz conductivity we measure for below-gap excitation of these blends across all excitation fluences strongly suggests that such direct excitation of a subgap charge transfer state is a principal mechanism contributing to charge generation here.

The value we determine for the blend is approximately two to three orders of magnitude smaller than those seen for neat polymer films, which should be expected since it is the interface surface forming the heterojunction between poly[3-hexylthiophene] (P3HT) and [6,6]-phenyl-C butyric acid methyl ester (PCBM) that will influence the probability of an encounter between oppositely charged polarons in the blend, thus lowering the probability of bimolecular charge recombination.

[49]Costa S. et al (2007)

We conclude that for PH_3 the cluster-formation (or localization) effects appearing in the rotational energy level spectrum cause very significant qualitative changes to the cluster-transition line strength values at high J.

It shows that O_2 does not react directly with methylene blue, but it somehow promotes the plasma chemical reactions driven by corona discharges in water.

14. **Summarize the extract from the paper of Japanese scientists. Give your opinion on it according to the guidelines for the *Discussion* section. Formulate the purpose of the paper.**

The ratio of the two conformers was 8:1 in the present study, which is in good agreement with the results from the millimeter-wave spectroscopy, while the ab initio calculations predicted a more abundance of the second conformer. The minor species could not be detected in the previous GED study. The present combined analysis using the GED data and the rotational constants showed the useful method in order to investigate the complex system containing some low abundant species. As the GED method is not so adequate to distinguish the conformers differing in hydrogen positions, the obtained molecular structures may be average ones for the various conformers. However, the molecular parameters for the average structures at the vibrational ground state would be precise because of the aid of the rotational constants. In this study, anyway, it was not able to find other conformers in the gas phase except the present two conformers.[50]

[50]Iijima K., Nakano M. (1999)

15. **Read the extract and state its informative role in the paper.**

We recommend application of the mentioned expanded graphite for the conductivity enhancement purposes. Significant reduction of battery internal resistance should be realized even with reduced graphite loading. This could make it possible to increase electrode's active material loading, thus increasing batteries' nominal capacity.[51]

16. **How could you simplify the following sentence?**

Also, as a result of the purification procedure, most of the Fe particles were removed (<0.2wt%), which made it impossible to use these tubes for the magnetically guided drug delivery.

17. **Retell the extract from the paper of Indian scientists. What section of an academic paper is the most suitable for such information? Give your criticism on the language if necessary.**

Fullerenes are powerful antioxidants, reacting readily and at a high rate with free radicals, which are often the cause of cell damage or death. Fullerenes hold great promise in health and personal care applications where prevention of oxidative cell damage or death is desirable, as well as in non-physiological applications where oxidation and radical processes are destructive (food spoilage, plastics deterioration, metal corrosion). Major pharmaceutical companies are exploring the use of fullerenes in controlling the neurological damage of such diseases as Alzheimer's disease and Lou Gehrig's disease (amyotrophic lateral sclerosis – ALS), which are a result of radical damage. Drugs for atherosclerosis, photodynamic therapy, and anti-viral agents are also in development. Fullerenes are known to behave like a "radical sponge" as they can sponge-up and neutralize 20 or more free radicals per fullerene molecule. They have shown performance 100 times more effective than current leading antioxidants such as vitamin E. Fullerene is highly soluble in almond oil and

[51]Barsukov I. et al (2000)

thus it can be used for screening test for ocular tissue toxicity indicating no adverse effect.[52]

18. **Read and translate the following sentences paying special attention to the clichés used. Copy the most suitable and the ones you like. Give your opinion on the language used.**

Under the condition (a) the streamers appeared to be around 2 cm in length.

It was found that the pyridine ring of nicotine is nearly perpendicular to the $C_3 – C_5 – C_6 – C_4$ plane of the pyrrolidine ring. This can be regarded as a consequence of the repulsion among various H atoms. As a result of the relative position of two rings, the interatomic distances of two N atoms in nicotine were determined to be 4.885 ± 0.006 and 4.275 ± 0.007 Å, for the A/(eq, eq, syn) and B/(eq, eq, anti) conformers, respectively.

To provide a reliable template to construct a nAChR model, it should be the best to determine the in vivo structures of agonists. However, there is no practical experimental method to obtain molecular structures in aqueous solutions, and it can be said that the gas-phase structures provide the best substitutes for them. This is because the gas-phase structures are free from the packing effect of solids that sometimes changes the molecular structure significantly.

On the other hand, other structural parameters are found to have almost the same values in the gas and crystal phases with the exception of N C distances in the N-methylpyrrolidine ring.

In addition to the fluence dependence of the initial generation of charges, the subsequent recombination of charges has also to be considered.

To interpret the low-fluence conductivity data, it has to be taken into account that the carrier density is built up by successive pulses creating the

[52]Yadav B., Kumar R. (2008)

wrap-around effect mentioned in the previous paragraph. The sublinearfluence dependence observed could be caused by nonlinear effects in the charge generation and/or recombination processes. However, the linear fluence dependence of the photoconductivity in the high-fluence regime suggests that the latter is the case.

A significant part of the discrepancies between the results of the approximate model and those of the variational calculation are caused by the fact that PH3 is not at the strict local mode limit.

The high-performance liquid chromatograph and ion chromatograph analysis demonstrated that the whole process (in the presence of Fe^{2+}) involves three steps: the first step is the attack of the hydroxyl radical on the aromatic rings of the pollutant, where the predominant products are o-dihydroxybenzene, p-dihydroxybenzene and p-benzoquinone. The second step is the rupture of benzene rings in which the major products are maleic acid, oxalic acid and formic acid. The last step is further oxidation where the above acids were completely decomposed into CO_2 and H_2O.

Since the thermal conductivity of alumina is approximately 15 times higher than that of quartz, the temperature rise of the antenna is suppressed by adopting alumina as plotted in Fig. 4.

Energy dispersive X-ray spectrum taken from this nanowire confirms the presence of nickel element with no signal corresponding to oxygen.

The benzophenonechromophorewas found to be much less effective than the Irgacure 2959 systems.

Of particular interest was the effect of adding the Actilane resins to the free Iragcure 2959 on transient formation.

Not only are these cells shown to be killed immediately by high doses of plasma treatment, but low doses are shown to promote apoptotic behavior as detected by TUNEL staining and subsequent flow cytometry.

19. **What do you think about such a structure of the sentence? What should be changed in it?**

This phenomenon can be understood if we note that as the voltage increased, an enormous quantity of heat was produced around the anode, vapourizing the water around it.

20. **Characterize the following extract.**

Unfortunately, our computer facilities do not allow us to calculate most of these compounds by the ab initio method. Using the data from Table 1, one can perform a detailed analysis of the influence of substituents and "integration" of molecules I and II on the geometry of the five-membered rings.

21. **How could you describe the plot using the information from the sentence? What do you think the title of the graph is?**

From the curve in Fig.3 it can be seen that the higher the voltage applied, the faster the phenol disappears.

22. **Characterize the following extract. In what part of the paper is it possible to find it?**

Formula BT 2939APH was observed to have higher lubricious properties, which leads to up to 40% lower tool wear as compared with electrodes having synthetic graphite. This has been determined by the new method of expedited tool wear estimation, which we have developed and will discuss during the presentation.

Purified expanded graphite, another new type of material, just recently adopted by the alkaline battery industry, represents an attractive conductivity enhancement candidate for the premium performance alkaline batteries. Switching to SGC's significantly higher conductive expanded graphite instead of synthetic flake material recently enabled up to 32% improvement in the performance of the commercial alkaline batteries.[53]

[53]Barsukov I.et al (2002)

Задания для самостоятельногоанализа и пересказа раздела *Обсуждение* академической статьи

Read the *Discussion* section of any scientific paper close to your research and answer the following questions.

How are the most significant results highlighted? Copy topic sentences and clichés.

In what way do these results relate to the original question?

Do the data support the hypothesis?

Are the results obtainedconsistent with what other investigators have reported on?

If any results were unexpected, how are they explained? Do you think there is another way to interpret the results?

What further research would be necessary to answer the questions raised by the results obtained?

How do the resultsdiscussed fit into the big picture?

Paraphrase the concluding remarks of the section in a one-sentence summary, emphasizing why it is relevant.

Write a draft version ofthe *Discussion*section: address every experiment and methodused according to the results presented; describe observations confirmed and disadvantages you experienced; provideappropriate interpretation ofthe results meaning in the larger context of the problem studied; formulate the final concluding remark.

Some useful verbs to be used are given below: determine, detect, assess, measure, elucidate, clarify, explain, speculate, conclude, believe, know, indicate, suggest, support, confirm, imply, need, correlate, associate

Bear in mind that you should use **present tense** when giving answers to the questions formulated in the introductory part and discussing the current literature, while **past simple tense** is suitable for addressing the results obtained.

Раздел 6. ЗАКЛЮЧЕНИЕИВТОРОСТЕПЕННЫЕРАЗДЕЛЫ

I am turned into a sort of machine
for observing facts and grinding out conclusions.
CharlesDarwin (1809-1882)

Заключительная часть академической статьи под названием *Conclusions*содержит наиболее весомые и существенные результаты проведенного исследования.В этом разделе еще раз упоминается выдвинутая для подтверждения гипотеза;обобщаются полученные результаты, оказавшиеся наиболее убедительными и интересными; кратко обосновывается мысль о том, подтвердилось ли проверяемое предположение; результаты вписываются всуществующее научное знание для получения более полной и стройной картины; намечаются открывшиеся перспективные пути исследования;формулируется междисциплинарная значимостьнового приобретенного знания. Совпадения с резюмированным изложением результатов предпринятого научного изыскания в разделе*Abstract* должны быть минимальными.Вряд ли можно считать предложения, содержащие клише

типа*Itwasinvestigatedthat*…, *Itwasstudiedthat*…,качественными и аргументированными выводами. Объем этого раздела составляет, как правило, не более 200 слов [3]. Первое предложение заключает в себе тот вывод, который вы хотите оставить в памяти читателя.

Обратимся за иллюстрацией сказанного к оригинальным источникам, приведя заключительную часть из академической статьи японских ученых[54].

Metalloporphyrins of aluminum, zinc, manganese, cobalt and rhodium complexes have been demonstrated to serve as excellent initiators for controlled anionic and free-radical polymerizations. The discovery of these metalloporphyrin-based initiators has led to significant contributions to the progress of precision macromolecular synthesis via living polymerization. In particular, it has been determined that aluminum porphyrins are very unique initiators with an exceptionally wide applicability. In the case of polymerization with metalloporphyrins, the large rigid macrocyclicporphyrin chelate is considered (1) to assure a uniform reactivity of all growing polymer molecules; (2) to control the electronic properties of central metal atoms; (3) to serve as light-harvesting units; and (4) to provide a steric barrier around the active site. Studies on steric control of polymerization with metalloporphyrins is a subject worthy of further investigation.

Первое, или ключевое, предложение полностью раскрывает тематику проведенного исследования, причем с каждой последующей фразой все отчетливее и яснее становятся отдельные подробности. Вторая половина *Заключения* расширяет авторские выводы, предлагая взглянуть на приобретенные знания с новой, более перспективной точки зрения.

Таким образом, информацию, необходимую для раздела *Conclusions*, можно также свести в таблицу.

[54]Aida T., Inque Sh. (2000)

Таблица 7.

Структурные компоненты раздела *Заключение*

Структурная единица	**Содержание**
Предложение 1.	*Topicsentence*: гипотеза, резюмированиецелей и задач
Предложение 2.	Самые важные полученные результаты; подтверждение гипотезы

Окончание Табл. 7.

Предложение 3.	Вклад автора в научную картину мира; интегрирование полученных результатов
Предложение 4.	Новые перспективы исследования
Предложение 5.	Заключительное

Раздел *Acknowledgments* является необязательным, факультативным. Благодарность выражается всем, кто помогал при выполнении научного исследования материально, предлагал идеи в дизайне и предоставлял оборудование, обеспечивал реактивами, непосредственно участвовал в эксперименте. Это самый краткий раздел, избегающий речевой цветистости и расположенный между частями *Discussion*и*LiteratureCited*. Для выражения своих благодарных чувств автору достаточно 40 слов [3].

В разделе *LiteratureCited*(или *References*) приводятся сведения обо всех упоминающихся в работе источниках. Имеется несколько способов библиографического описания. Наиболее распространена алфавитная последовательность, однако допустимы и ссылки на авторов в определенных местах работы: *Scarlet (*1990*) thoughtthatthegenewaspresentonlyinyeast,*

*butithassincebeenidentifiedintheplatypus (*IndigoandMauve, 1994*) andwombat (*Magenta, etal., 1995*).*

ВОПРОСЫ И ЗАДАНИЯ

1. What results should be included in the *Conclusion* section?
2. What is the algorithm of the *Conclusion* section?
3. In what way does the *Conclusion* section differ from the Introduction?
4. What is the difference between the *Discussions* and the *Conclusion* sections?
5. **What is the key conclusion in the following extract?**

The primary battery electrode conductivity enhancement materials market is currently undergoing fast evolution, which is being backed up by significant changes in graphite technology. Natural thermally purified and expanded graphite seem to be the most promising types.

6. **Read, translate and retell the following *Conclusions* section. Speak on the main ideas mentioned, describe the sequence of facts given and compare with the typical algorithm for this part. What would you like to change and reformulate here?**

From the above discussion it can be inferred that electrical discharge techniques may prove to be more effective, cheaper and environmentally friendly than conventional water treatment techniques. There is a need for further developments in the area of water treatment by electrical discharges. In particular, there is a need to find new and more efficient materials that may be used as catalysts for ozone generation. Further studies are required to clarify the role of the physical and chemical properties of catalyst materials on ozone generation.

The application of pulsed high voltages during ozonation may result in better dispersion of ozone in water and faster conversion of ozone into free radicals, which may lower the cost of the ozonation processes. Water treatment by direct electrical discharges is being tested on an industrial scale. Further study on the destruction behaviour of possible water pollutants, including microorganisms and toxic organic compounds from industrial effluents, is mandatory. The identification of breakdown products needs to be carried out to clarify the mechanism of plasma chemical reactions involved. In particular, the studies on the application of suitable catalysts in an electrical discharge reactor have great possibilities to make the process more effective, cheaper and competitive with conventional methods. Both the electrical discharges in water and above water level have their merits and demerits. Electrical discharges above water level, that is in gas phase, require less energy for the discharge to take place while electrical discharges in water make a simpler system and produce the chemically active species in water, which can directly attack the aqueous pollutants. Among the types of electrical discharges, pulsed corona discharges are the most often studied and seem to be the most promising for water purification. The growing demand for the cleaning up of raw water and industrial waste water without the use of hazardous chemicals or the generation of secondary pollutants together with the rapid pace of development in the area

of electrical discharges for water purification suggest that these techniques may play a major role in the water treatment industry in the future.[55]

7. **What do you think about the following topic sentences in the Conclusions section? Give your criticism and suggest possible changes.**

It was shown in this paper that the mechanism used in the literature to explain copper electrodissolution in a HCl medium, at low current densities, presents an impedance structure with a coupling between adsorption and mass transport.

*The large amount of high-level ab initio data presented in this and previo*us*studies not only shapes our understanding of the conformational behavior of simple free amino acids but also provides vital data for different types of experiments applicable to probe these molecules.*

We have measured the terahertz-frequency photoconducivity of two model polymer-fullerene blends, varying the incidentfluence over four orders of magnitude. We observe a qualitatively similar time dynamic and terahertz-frequency conductivity spectrum upon photo-excitation at energies resonant with the peak of the π−π absorption and well below it.*

We have studied the nature and the structure of the plasma that is generated in our experiments where a pulsed discharge source is coupled to a pulsed free jet expansion.

The atmospheric pressure surface barrier discharge has many industrial applications. To obtain better results in applications, a study of its characteristics is essential. Optical emission spectroscopy and electricalmethods have been used to get its excitation temperature and electron density.

For the final goal of establishing a portable liquid analysis system that enables on-site analysis of a tiny amount of aqueous solution, a miniaturized

[55]Malik M. et al (2001)

atmospheric-pressure microplasma jet source has been developed for use as a sensitive detector. In order to improve the power transfer efficiency and stability of the plasma jet source, the effects of chip material and the antenna design have been experimentally studied.

The main goal of the present work was to construct a potential-energy surface for the electronic ground state of NH_3 that accurately covers the region up to 20 000 cm^{-1} above equilibrium.

The primary battery electrode conductivity enhancement materials market is currently undergoing fast evolution, which is being backed up by significant changes in graphite technology. Natural thermally purified and expanded graphite seem to be the most promising types.

8. **State the function of the following sentence. Would you like to make some changes into it?**

A better understanding of the experimental impedance diagrams would consider a kinetic step to explain precipitation and growth of a CuClflm at the surface of the copper electrode.

9. **Below comes the *Conclusion* section form a scientific paper written by Chinese scientists. What information is not given here? What do you think about such a form of presenting conclusions?**

From the experiment, the following conclusions can be drawn.

(i) Increasing the applied voltage and adding the catalyst and some acids and alkalis will be favourable for phenol removal.

(ii) Phenol can be exhaustively degraded by means of water glow discharges in this set-up.

(iii) The degradation went differently in the presence and absence of catalysts. In the presence of Fe^{2+}, the major intermediates are benzoquinone, maleic acid, oxalic acid and formic acid.

(iv) The energy efficiency for decomposition of aqueous phenol in this work was of the order of 10^{-9}mol J^{-1} at the operating voltage of 600V, which is comparable with that of pulsed corona discharges in water operating at around 30 kV. It is well known that in a pulsed corona discharge reactor, the operating conditions are very limited: the water must be desalted and the power source must be pulsed, whereas in our process, these procedures did not need to be followed.[56]

10. **What is your opinion of the following extract? Do you think it is suitable for the *Conclusion* section? Paraphrase is as a concluding remark.**

Partly on the basis of the measured dipole moment components for conformers I and IIA and the observed integrated areas of the strongest lines of different conformers, Godfrey et al. reported experimentally determined approximatelower limits for conformational energies relative to those of α-alanine I. All of their estimates are significantly differentfrom the high-quality theoretical relative energy predictions ofthis report. The discrepancies deserve further study.[57]

11. **Read the *Conclusions* from the joint paper of German and Polish scientists. Analyze the algorithm used, give your opinion on it. Underline clichés used. Suggest possible changes.**

We have successfully synthesized single phase α-Fe-filled multiwalled carbon nanotubes on a bulk scale. The systematic study of the acid treatment in the purification procedure allows us to find the optimum hydrochloric acid concentration. The application of 2M HCl solution resulted in a significant reduction of the external iron products, while the iron inside the tubes was not

[56]Jinzhang G. et al (2003)
[57]Császár A. (1999)

etched away. Increasing the length of time for this acid treatment did not improve purity of the sample. We believe that presented study is a step forward to the application of these materials as nano-heaters in the biomedical field of anti cancer therapy.[58]

12. **Give your opinion on the following *Conclusions*.**

Thus this study gives the basic knowledge of structure of fullerenes and their applications. The fullerenes can be used as organic photovoltaics (OPV). Other uses of C_{60} like catalysts, in water purification and biohazard protection, portable power, vehicles and medical.[59]

13. **Underline all the clichés used in the following extract. What is your opinion on the stylistics used? Suggest the changes of the underlined phrases.**

To provide a reliable template to construct a nAChR model, it should be the best to determine the in vivo structures of agonists. However, there is no practical experimental method to obtain molecular structures in aqueous solutions, and it can be said that the gas-phase structures provide the best substitutes for them. This is because the gas-phase structures are free from the packing effect of solids that sometimes changes the molecular structure significantly.

14. **Give your opinion on the following extract. What information is conveying? Do you think this is a suitable part for the *Conclusions* section? Is it possible to paraphrase the text? Make your suggestions to formulate it as the final results and future perspectives.**

Thus, one could imagine that the cluster states could be characterized by such spectroscopic methods as it happened for the analogous cluster states in H_2Se. The investigation of these states could help elucidate the phenomenon of

[58]Costa S. et al (2007)
[59]Yadav B., Kumar R. (2008)

rotationally induced chirality discussed for triatomic molecules by Bunker and Jensen. The unfortunate fact that PH_3 is both poisonous and volatile may dampen the enthusiasm for undertaking experimental investigations of the interesting cluster phenomenon in this molecule.

After we had submitted the initial version of the present work, Butler et al.reported new measurements of phosphine intensities in the 2.8–3.7 lm region. They did not, however, use the experimental intensity values to determine vibrational transition moments that we can compare with our theoretical results. Instead they list, for a number of bands, 'sum intensities' (i.e., sums of the intensities of observed/assigned transitions in a given band) which provide rough measures of the total band intensity. Sum intensities obtained from our simulated spectra show broad agreement with the new experimental values so that this comparison provides further validation of our new ab initio dipole moment surface for the electronic ground state of PH_3.[60]

15. **Give all possible suggestions to paraphrase the sentence highlighting perspectives of future investigation.**

Work on the synthesis of silica gel–organic polymer composites is in progress.

16. **Combine the following two sentences into one describing new perspectives for researchers.**

Carbon nanotubes (purified/modified) have a high potential of finding unique applications in wide areas of medicine. Also, the encapsulation of other materials in the carbon nanotubes would open up a possibility for their applications in medicine.

17. **Is it possible to restore the purpose of the research undertaken using this topic sentence?**

[60]Yurchenko S. et al (2006)

Nanocrystalline titanium dioxide powders were obtained from stable sols produced using particulate sol-gel route in various processing parameters.

18. **On the basis of the following conclusions try to formulate what questions remain unanswered.**

Very low doses of floating electrode dielectric barrier discharge where no cell necrosis was observed were shown to initiate apoptotic behavior, or programmed cell death in Melanoma cancer cells. During apoptosis, cells undergo a series of complex biochemical changes leading to cell death without causing inflammation. Apoptotic behavior was deduced from the fact that treated cells do not initially die but stop growth and die en masse 12–24 h following treatment, while untreated cells continue to grow and proliferate.

Previously it was shown by authorsand by other groupsthat plasma is able to destroy cells; however, it was also observed that plasma might be able to initiate or catalyze some biochemical processes in biological systems. This is an initial step toward understanding mechanisms by which non-thermal atmospheric pressure discharge in direct contact with cells is able to influence their activity.[61]

19. **Restore the major objective of the investigations undertaken; offer the titles for the papers; suggest key words.**

The advanced graphite technology development level currently allows offering at least two alternatives to the synthetic graphite, which was traditionally used for the conductivity enhancement purposes in batteries since 1960's. These are purified natural and expanded types of graphite.

Three new palladium N-heterocyclic carbene clusters have been synthesized and, in contrast to their long established tertiary phosphine analogues, characterized by X-ray crystallography.

[61]Fridman G. et al (2007)

20. **Read the following sentence. What do you think about the beginning the Conclusion section with the negative opinion?**

In none of the reactions examined was there any indication that the rhenium system was forming the analogue of the manganese compound 5, nor in the earlier investigation of the manganese systemwas there any evidence for compounds of type 6a/7a.

21. **Underline and copy the most popular clichés used in the Acknowledgment section. State what assistance was appreciated by scientists.**

This work was supported by the European Commission through Contract No. HPRN-CT-2000-00022, "Spectroscopy of Highly Excited Rovibrational States," and Contract No. MRTN-CT-2004-512202, "Quantitative Spectroscopy for Atmospheric and Astrophysical Research."

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Write the *Conclusion* section of your paper including: summaries of major numeric findings; explanation of how these findings relate to initial hypothesis and to other studies; theoretical and practical values of the research; new approaches and directions of investigation.

Задания для самостоятельного анализа и подготовки пересказа оригинального источника:

1. Introduce the title of the paper, its authors and the source of publication.

2. List the main structural parts of the paper.

3. Explain the broad context of the problem to be investigated.

4. Review the mentioned literature to identify theories and existing evidence; name their positive features and achievements; highlight the questions remains unanswered.

5. Formulate the major objective of the investigation; enumerate the methods used.

6. Present background information of the study.

7. Render every paragraph in one sentence.

8. Give examples of topic sentences introducing the purpose of each table, graph, figure and comparison.

9. Present the most significant and specific results obtained by the authors.

10. Explain in what way the given results correspond to the questions under study.

11. Analyze how a discussion and conclusion sectionssummarizing numeric findings relate them back to the research question and to previous studies.

12. Consider the weight and consequence of the results obtained given in the *Conclusions*section; value the authors' contribution.

13. Describe the importance of the study undertaken; prove that it was worth doing it.

14. Describe new directions of future research.

15. Express your criticism on the paper you have read.

16. Point out the clichés and linking expressions.

17. Explain in what way it is connected with your investigation; name the most valuable findings and observations.

Примерный план пересказа оригинальной статьи по специальности

1. The paper under the study is titled…It was written by a group of scientists from …It was published in the Journal … in 19..(20..)

2. As it is an academic paper its structure is typical. It contains several parts such as Annotation, Introduction, Experimental description, Materials and methods, Discussion and Conclusion. There are also Acknowledgements and List of references.

3. The paper is devoted to the problem of…The **Introduction** describes the importance of… and its main applications. At the end of the Introduction the authors present their aim: they wanted to investigate…

4. Studies of the interactions of … with … have recently intensified. Such increased interest is connected with … Investigations by American (Russian, British, Japanese, etc.) scientists have demonstrated that … However, the problem of … still remains unanswered.

5. In the **Experimentalpart** the authors mention the methods they used, the main equipment and procedures. Thus, they used … … … methods to observe … and reveal …

6. Conditions of the research undertaken.

7. The most significant **results**are given in the next part. The authors observed the mechanism of…; revealed the properties of…; learnt specific features of… All their results are presented in the form of plots, graphs, figures, images, tables… Figure 3 shows… Table 2 demonstrates…

8. Theobtained value of … is in a good agreement with the literature data. The changes observed during … supported the hypothesis about the close

interrelations between … and … Though the authors could not prove the supposition about … In the **Discussion** they proved that…

9. The most significant and valuable results of the investigation are summarized in Conclusions. Thus, the authors stated that their study gave the basic knowledge of the structure of …; described the properties of…

10. The part **References** contains … sources that demonstrates the validity and reliability of the results.

11. This investigation helped to realize the mechanism of … and highlighted the phenomenon of …

12. The paper seems very important as there are data about…

13. The authors directed some new approaches to the problem under study. They proposed to …

14. The paper seems very significant (necessary, valuable) to me because it highlighted the most difficult problems connected with the research. It greatly contributed to the description of …; added new knowledge of the mechanisms of…

15. It is possible to use this paper in the literature review.

При описании графиков можно воспользоваться следующими глаголами:

Быстро, резко падать	*plummet, dive*
Быть неустойчивым, меняться	*fluctuate*
Возвращаться в исходное положение	*recover*
Возрастать, увеличиваться	*increase, improve, gain, rise*
Возрасти в десять раз	*increasetenfold*
Возрастиот … до …	*increase***from** … **to** …
Выравниваться, становиться ровным	*leveloff*
Достигать максимума	*peak*

Достичь максимального значения	*reach a peak***of/at…**
Достичьнаименьшегозначения	*reach a low point***of/at…**
Находиться на каком-то уровне	*stand***at**…
Незначительное изменение	*dip, edge up, edge down*
Падать, уменьшаться	*decline, fall, drop, decrease*
Резко подниматься, повышаться	*rocket, soar*
Увеличиваться вчетверо	*quadruple*
Увеличиться на …	*increase***by** … или*There is an increase* **of** ...
Увеличиться, вырасти до какого-то значения	*grow***to…**
Удваиваться, увеличиваться вдвое	*double*
Уменьшаться вдвое	*halve*
Утраиваться, увеличиваться втрое	*triple*

Раздел 7. ПРАКТИЧЕСКИЕРЕКОМЕНДАЦИИ

Writing in English is the most ingenious torture ever devised for sins committed in previous lives.

JamesJoyce (1881-1941)

Рассмотренный алгоритм работы над изложением результатов проведенного исследования в виде академической статьи легко свести в итоговую, обобщающую таблицу, в которой объединяются как основные, так и второстепенные составляющие ее разделы. Иными словами, выстраивается логическая цепочка движения научной мысли исследователя от выдвижения первоначальной гипотезы к тщательному планированию и проведению теоретических или практических изысканий

с целью получения нового, дополненного и усовершенствованного знания, выраженного в форме ключевых выводов.

Таблица 8.

Композиционные элементы научной статьи

Раздел и его содержание	**Цели и задачи**
Введение: для чего проводилось исследование	Выделение проблематики работы; сжатая характеристика имеющихся данных; описание предпосылок проведения исследования; четкая формулировка собственных намерений
Материалы и методы: что было сделано	Обобщение обстоятельств и условий исследования, необходимых для воспроизведения экспериментов; освещение модели изучения и обработки данных

Окончание Табл. 8

Результаты: что было обнаружено	Изложение полученных результатов; сравнение с литературными данными; соотнесенность с начальной гипотезой
Таблицы, **рисунки**, графики: что показали результаты	Наглядное объяснение полученных результатов (без злоупотребления разъяснениями в тексте)
Обсуждение: что означают полученные результаты	Интерпретация итогов исследования в контексте имеющейся литературы
Заключение: что	Формулирование ключевого вывода;

планируется	определение потенциального вклада в научное знание; предложение новых направлений исследования
Выражение **благодарности** и признательности: кто оказал существенную помощь в проведении исследования	Указание личных имен и официальных названий учреждений
Ссылки: кто уже внес серьезный вклад в эту область научного знания	Включение самых значительных источников

Знание схемы построения и содержательного наполнения каждой части академической публикации будет способствовать полному и достоверному описанию рассматриваемой научной статьи. Для того чтобы грамотно излагать собственные мысли по поводу прочитанного, на первых порах придется воспользоваться клишированными фразами, помогающими воспроизводить изученный материал. Из всего нижеприводимого списка разговорных выражений выберите и составьте свой собственный комплект фраз.

Любой пересказ начинается с элементарного представления выходных данных академического издания. Прежде всего, упоминается его название:

The book (paper, volume, article, essay) to be discussed is titled …

The discussed book (paper, volume, etc.) is called…

The title (name) of the paper under study is…

The paper under discussion is titled …

The title of the research paper is perhaps the most important part, because the key words in the title help make a decision whether the paper is of interest or not. Thispaperconcernstheproblem (issue, question) of…

Далее внимание следует привлечь к именам ученых, подготовивших статью к публикации. Рассказатьобавтореможноспомощьютакихклише:

The author (editor, publisher) of the book is…

The paper is written by a group of scientists from … (university; country). The authors are well-known (distinguished, outstanding, famous) scientists in the field of …

The contributor of the journal (magazine) is… from Department… of (country).

Не менее важна информация о том, где и когда анализируемое издание вышло из печати, кому оно адресовано, специалистов каких областей может заинтересовать. Этуинформационнуюфункциювыполняютстандартныефразытипа:

The article was published (edited) in 19…, 20…in the journal…

The book is addressed to scientific workers; professional scientists; undergraduates; post-graduates;

- *those working in the field of…*
- *those studying the problems of …*
- *those familiar with the field of…*
- *those approaching the problems of …*

The book is written for researchers.

Несмотря на то, что академическая статья имеет единообразную классическую структуру, об основных ее частях необходимо упомянуть в следующем виде, отдельной строкой выделив цель написания:

The Structure of the article is as follows. It contains an Abstract, Introduction, Experimental part, Results and Discussion, Conclusions, Acknowledgements and a List of references.

The paper contains (includes, falls into) … (5) parts.

The heading of the chapter (section, part) is…

The paper contains a summary (a treatment of …, a list of references, a large amount of useful information).

The purpose (aim, objective) of the paper is to provide…

The paper aims to provide (acquaint, present, show) …

Далее следует кратко изложить суть каждого раздела прочитанной статьи, чтобы пересказ выглядел более полно. Для этого можно избирательно воспользоваться некоторыми рассуждениями авторов, взятыми из самого источника. Однако при этом не следует злоупотреблять зачитыванием отдельных фрагментов из каждой части, помня о различиях между письменной и устной речью. Помощь здесь окажут нижеследующие стандартные высказывания, в которые необходимо вставить соответствующие анализируемой статье ключевые термины:

Introduction *identifies the subject of the research;*

- *provides background information about the experiment;*
- *states the problem and the hypothesis of the investigation;*
- *presents theoretical basics of the study;*
- *formulates the thesis statement.*

The paper begins with a discussion of (introduction to, introductory discussion of)…

Прежде чем перейти к рассмотрению самой важной части анализируемого источника, необходимо кратко описать ход исследования, чтобы постепенно ввести собеседника в творческую лабораторию, осветить основные этапы работы, обстоятельно раскрыть методы своей

работы. Первоочередное внимание, однако, сосредоточивается на описании полученных результатов, для чего уместны такие конструкции:

*In the part **Methods** the author(s) describes the subject of the study, the apparatus and equipment used, the procedure followed.*

The paper (the author) discusses (deals with, is concerned with, covers, considers, gives consideration to, describes, gives an accurate description of, outlines, emphasizes, places emphasis on) the problem of …

The paper provides the reader with some data on … (some material on …; some information on …; an introduction to …; a discussion of …; a treatment of …; a study of …; a summary of…; some details of …; a useful bibliography; a list (set) of references, key references)

A careful account is given of …

A detailed (thorough) description is given of the theory (problem, method) of…

Much (little) attention is given to …

Of particular (special, great, little) interest is the method of …

Of great (little) importance is the method of …

Results** report on the findings supported with statistical data, diagrams, graphs, tables and figures, etc. **Note whether these findings are consistent with the advanced hypothesis!

It is notable (noteworthy, praiseworthy, fortunate, unfortunate, a mistake, a slight disappointment, to the author's credit) that…

The author has succeeded in showing (providing, presenting) the results of… Though he failed to show (to exhibit, to provide, to present, to give an account of, to direct our attention to) …

The paper is a valuable source of ready information.

Из раздела *Обсуждение* следует выбрать наиболее значимые рассуждения по поводу обнаруженных явлений, реакций, механизмов, привносящих новое понимание и толкование изучаемых феноменов.

Discussion/Conclusion *evaluates and interprets the results obtained, makes inferences from the results, discusses the implications of the findings. The paper ends with a discussion of … In conclusion (in summary, summarizing) the author emphasizes … and proposes … The book is profusely (poorly) illustrated with diagrams (tables, colour plates, photographs, images).*

Желательно, чтобы в заключительных словах пересказа академической статьи звучала ваша самостоятельная оценка важности, нужности и цельности извлеченной информации, ее значимости для собственных исследований и перспективах использования полученных данных в настоящей и будущей работе. После этого переход к описанию своих научных изысканий будет логичным и последовательным.

Владея навыками распознавания главных элементов структурной композиции статьи и умениями извлекать нужную информацию из любой части академической публикации, можно достаточно легкосравнивать оригинальные зарубежные источники с целью выявления совпадений или противоположностей в научно-методическом подходеи трактовке проведенных экспериментов. В качестве примера рассмотрим и сопоставим две зарубежныестатьи, опубликованные в журналах международной издательской компании*Springerlink*. Первая статья под названием*Synthesisofthiol-functionalizedMCM-41 mesoporoussilicasanditsapplicationinCu(II), Pb(II), Ag(I) andCr(III) removal* подготовлена группой авторов из китайского университета Цинхуаиопубликована в 2010 г. Вторая статья *Adsorptionofidioneonthesurfaceofsilicamodifiedbypolyvinylpyrrolidoneandalbumin* представлена отечественными учеными. Обе статьи посвящены

синтезу и исследованию физических свойств искусственных гибридных материалов с использованием золь-гель технологии. Данная тема на сегодняшний день является одной из актуальнейших в области современной химии.

Попытаемся проанализироватьосновные этапы сравнения источников с параллельным введением стандартных описательных разговорных фраз.

Прежде всего, необходимо выделить и обозначить проблематику, которая объединяет эти статьи: *Thepapersaredevotedtotheproblemof* ....Дальше следует подчеркнуть типичную структуру написания этих статей и выделить основные разделы, рассматриваемыеавторами: *Asbothpapersarescientificwritingstheirstructuresarerathertypical. You may easily single out several parts in very paper.*После этогорекомендуется рассказать о каждой части подробнее, чтобы слушатель имел представление, о чем повествует данная статья. Например: *In the first introduction the authors highlight the problem of* ...Обратите внимание, что клишированные обороты и грамматические конструкции можно заимствовать из рассматриваемых статей. Однако не следует забывать, что в анализируемых источниках используется письменная речь, которая не подходит для устного общения. Поэтому воспользоваться при беседе можно только ключевыми словами и нужными терминами, а вот построение предложений, применение глаголов-связок и слов-«мостиков» целиком зависит от навыков и умений говорящего.

Приописанииэкспериментальнойчастинеобходимоподчеркнутьобъектиметодыисследования: *in the experimental part, the authors describe the object and methods of the investigation. The object is rather close in both cases*.Однакопринесовпадениинобъектовисследованияфразабудетследующей: *The objectsof investigation are fully different in both cases. There are many*

modern physicochemical methods thatwere used for characterization. Послекраткогоописанияэкспериментальнойчастиследуетостановитьсянараз деле«*Результатыиобсуждение*»: *The body of both papers is mainly represented by Results and Discussion part. As a rule it is the most important section because it demonstrates major results obtained*. Так как большинство результатов представлено в виде таблиц, то на них также необходимо заострить вниманиеи показать, как представлены основные результаты и насколько они наглядны: *Theresultsaregivenintheformoffigures, tablesandimagestomostvisuallyillustratethem. In the first paper you can see, for example,Figure 5 that shows that* ...Вконцесравнениянежелательновыделитьнаиболееинтересныйповашемумне ниюразделиобосноватьэто : *The most remarkable and interesting part of the papers considered is … from the second paper because the authors …*

Умения вычленить нужную информацию и грамотно ее представить, несомненно, пригодятся для будущих успешных выступлений со своими исследовательскими работами перед любой аудиторией. Ниже приводится сопоставление указанных статей в письменном виде с целью более качественной выработки необходимых навыков. На основании данного текста будет легко выделить дополнительные клише и запомнить алгоритм составления собственного устного сообщения.

The papers are devoted to the problem of synthesis (obtaining) of different materials with high adsorption capacity. Besides, the different ways of modification of these materials are considered. It should also be noted that this is one of the most essential problems of modern chemistry because these materials can be applied for effective removal of different chemical compounds from different solutions. For example, they can be used for removal of some toxins or heavy metal ions from water.

The first paper was written by Chinese scientists and published in Springer Journal Business and Science media in 2010. The second one is presented by Russian scientists working in the same area.It was published in the journal of Applied Spectroscopy in 2004.

As both papers are scientific writings their structures are rather typical. You can easily single out several parts in every paper. In the Introduction the authors highlight the problem of serious environmental pollution. They claim that adsorption technology is one of the most popular methods to remove heavy ions from water solutions. Nowadays, there are a great number of different materials which are used for removal but most of them have a low removal capacity and low selectivity. Sol-gel technology has been recently applied to obtained mesoporous materials with unique large specific surface area. And as a result of this the authors in the first article formulate their objectives in such a way: they are going to prepare a new thiol-functionalized mesoporous material. It should be applied for the removal of heavy metal ions from water solutions. They wanted to characterize obtained hybrid materials using modern physical and chemical analysis.

The second paper focuses on polymer modification of the surface which may provide new medical sorbents with new physicochemical properties. It iswell-known that albumin and PVP form a strong intermolecular complex with iodine. Therefore, the aim of the present work was to investigate the influence of modification of silica by albumin and PVP on adsorption properties. In both articlesthere are lists of references and you can see that scientists from different countries are engaged in this area. Sothe Introductionspresent their major achievements.

In the experimental part the authors describe the object and methods of the investigation. The object is rather close in both cases.There are silica-gel and 3-mercaptopropyltrimethoxysilane, which were used as initial reagents to

obtain a hybrid material. X-ray diffraction, low temperature nitrogen adsorption, transmission electron microscopy, IR-spectroscopy are used to characterize obtained materials. The specific surface area was calculated by employing BET method. The structure of these materials was identified by applying IR-spectroscopy.Surface modification of silica was studied by another group of scientists with the help of albumin and PVP. The method of UV-spectroscopy was used to identify the complexes of iodine with a polymer, both in a water solution and on the silica surface.

The bodies of both papers are mainly represented by Results and Discussion part. As a rule it is the most important section because it demonstrates the main results obtained. As the goal of the first paper was to prepare new thiol-functionalized silicas, their most important result concerns the characterization of mesoporous adsorbents and investigation adsorption capacity to the heavy metal ions. The other paper was written to show how modification by PVP and albumin leads to an increase in the sorption activity of silica relative to iodine molecules.

The results are given in the form of figures, tables and images to most visually illustrate them. In the first paper in Figure3 you can see that the pore size of the mesoporous silica decreasses after modification because of the functional groups in the mesoporous channel. Figure 4 shows TEM images of obtained adsorbents. In Figure2 you can see adsorption isotherms of functionalized silica. The adsorption equilibrium data of Cu(II) and Pb(II) ions were analyzed with Langmuir, Freundlich and Redlich-Peterson adsorption equation.

In the second paperFigures 1 and 3 represent isotherms of iodine adsorption on the surface of the initial, albumin- and PVP-modified aerosols.

At the end of every paper there is a Conclusion part. The authors of the first paper state that obtained thiol-functionalized silica has a high adsorption

capacity to Cu(II), Pb(II), Ag(I), Cr(III). The optimum molar ratio of TEOS/MPTMS was determined to be 4. The authors of the other paper summarize the conclusion in such a way that the modification of silica by PVP and albumin increases its adsorption ability relative to iodine molecules.

Every scientific paper contains a list of references to authors working in the same area. There are 40 sources in the first list and 15 in the other one. The most important and interesting part of the papers considered is introduction because we can learn the latesst scientific research in the modern chemistry. It is also very vital to know what scientific research have already been done in the world.

As for the research carried out in our laboratory, we also use sol-gel synthesis for obtaining mesoporous materials and develop some new techniques of obtaining hybrid materials in our own way.

Вышеприведенный сопоставительный пересказ строится по принципу отдельного рассмотрения каждого источника и передачи его основного содержания. Это самый простой вид работы с данными академических статей, который позволяет говорящемусосредоточиться преимущественно на условиях эксперимента, характеристиках полученных веществ, важных выводах, наиболее интересных лично для него. После этого легче переключиться на рассказ о своей научной деятельности. Однако более важно научиться находить общие и различные моменты в результатах и заключительных рассуждениях разных авторов относительно рассматриваемого материала.

Приведем еще один пример сравнения трех оригинальных источников, написанных группой китайских и пакистанских авторов. Так как сообщение об ученых, чьи работы изучаются, и названиях научных журналов, где они опубликованы, как правило, не представляет особой

сложности, опустим эти моменты, равно как и описание типичной структуры академической статьи.

Познакомившись с содержанием каждой статьи, можно совершенно точно определить основную общую проблему, в рамках которой было проведено исследование. Поэтому сразу же после представления выходных данных анализируемых источников допустимо небольшое собственное введение в проблему, отражающее авторское и свое видение.

Humanity has always been connected with the world surrounding it. But industrialization and the overuse of Earth's resources have become very dangerous recently. The industrial activity of people may destroy nature. For example, everyone knows that factories pollute the water. Next year 10 billion tons of various pollutants will bedumped into Water Ocean. But on the hand, factories provide jobs for people and produce necessary goods. Fortunately, people begin to realize the danger of environmental problems and try to solve them. Thus, people would have to stop using many useful things if they wanted to end pollution immediately. Butitisnotthesolutionoftheproblem.

Из этого краткого введения четко вырисовывается общая глобальная проблема, в которой вычленяется один аспект, объединяющий все статьи.

Another way to save the environments is connected with the necessity of cleaning up wastewater.There is a continuing need for the development of effective, cheap and environmentally friendly processes for the disinfection and degradation of organic pollutants in water. All articles are devoted to this global problem. Besides, it should also be noted that all three papers are theoretical works.

Далее на основе извлеченного материала делается вывод о том, что объединяет данные научные исследования попытки авторов найти наиболее перспективный и дешевый способ очистки сточных вод.

Каждаягруппаавторовпредлагает,
изучаетихарактеризуетопределенныйметод.

From the articles read we can learn some promising methods of water purification. The authors of the first article discuss the question of water purification by electrical discharges. They also use some mechanisms of plasma activation combining this method with the traditional ones (such as ozonation processes and others). In the second article the scientists write about the effect of O_2 and O_3 bubbling on decolourization of methylene blue due to pulsed corona discharges in water. And the third case states the oxidation of phenol induced by plasma generated by direct glow discharges at the tip of a platinum anode in aqueous electrolyte. Theyspeakaboutreactionpathwayforphenoloxidation.

Затем можно сконцентрироваться на конкретных специфических деталях каждой статьи, обратившись к иллюстративному материалу. Не следует излишне подробно останавливаться на особенностях анализируемых работ. Вместо этого гораздо полезнее и логичнее осветить те моменты, которые дополняют или уточняют вашу научную деятельность или просто привлекли внимание необычностью и оригинальностью.

We also read about some reactors used in practice such as pulsed corona discharge, dielectric barrier discharge and contact glow discharge (Fig. 1 on p.84). We can recognize specific details of the experiments (have a look at a scheme of the experimental setup) and the effectiveness of the method for methylene blue decolourization in water.

При толковании результатов, полученных авторами, следует помнить, что в данном случае речь идет о новом знании, позволяющем по-новому взглянуть на изучаемые вопросы. Приводя наиболее существенные

итоги исследования, желательно привлекать информацию, подаваемую в таблицах и рисунках.

The first article gives very important and necessary information about some examples of excitation, dissociation, ionization and electron capture reactions of high-energy electrons in electrical discharges in air (Table 2).Wealso learned about the mechanism of ozone conversion to free radicals during the ozonation process (Fig. 2). The influence of various parameters, such as pH or initial concentration, on the cleaning efficiency was studied in the second paper. Besides, we learned about the reaction pathway for phenol oxidation.

Завершается сравнение выводами относительно изучаемого явления. Здесь можно воспользоваться цитатами из самих оригинальных статей, которые необходимо предварительно сократить и упростить.

On the basis of the authors' conclusions it can be inferred that electrical discharge techniques may prove to be more effective, cheaper and environmentally friendly than conventional water treatment techniques. On the other hand, it was shownthat the rate of aqueous organic decomposition and energy efficiency increased in the following order: pulsed corona discharges with O_2 + O_3bubbling > pulsed corona discharges with O_2 bubbling >pulsed corona discharges with no gas bubbling.

Привязка излагаемых материалов и заключений к собственным исследовательским подходам может звучать не только в конце, но и в начале пересказа. Главное, провести логичную связь между анализируемыми данными, показав положительные моменты каждого рассматриваемого источника.

These articles are not very closely connected to my scientific work. I've studied the non-equilibrium solution components transfer initiated by glow

discharge with electrolyte cathode. But some results, which are given in these works, are very useful in my research.

Список стандартных фраз, которыми можно воспользоваться для сопоставительного пересказа нескольких статей, представлен ниже. Однако порядок фраз, их количество и набор могут свободно варьироваться в зависимости от того, на чем делается акцент при анализе и сравнении.

Таблица 9.

Набор клише для сравнительного пересказа

Раздел статьи	**Содержание**
Output data	The papers are devoted to the problem of… The first was written by … and published in… The second paper is presented by the authors from… It was published in the journal… in…
Structure	As both papers are scientific writings, their structures are rather typical. You can easily single out several parts in every paper. They areas follows.
Introduction	In the *Introduction* the authors highlight the problem of… and formulate their objectives. The first article is concentrated on… The second focuses on… Scientists from … countries are engaged in this area. Therefore, in the *Introduction* you can see the achievements of them.
Experimental	In the *Experimentalpart,* the authors describe the object and methods of the investigation. The object is rather close in both cases. It is… In the first paper … methods are used, in the second – the following ones.

Окончание Табл. 9.

Results	The body of both papers is mainly presented by *Results* and *Discussion* part. As a rule, it is the most important and voluminous section because it demonstrates the major results obtained. As the goal of the first paper was to estimate (analyze, measure…), their main result concerns … The other paper was written to show … so the authors stated that … The results are given in the form of plots (figures, tables, images…) to most visually illustrate them. In Fig. 5 you can see …
Discussion	The authors of the first paper highlighted the mechanism of … while in the second paper it is underlined that …
Conclusion	At the end of every paper there is *Conclusion* part. The authors of the first paper stated that … The authors of the other summarized the conclusion in such a way …
List of references	Every scientific paper contains a list of references to authors working in the same area. There are … sources in the first list and … in the other.
Your opinion	The most important and interesting part of the papers considered is … because … Connections with your research.

Пример еще одного сравнительного пересказа работ теоретического плана приводится ниже.В нем внимание говорящего сосредоточено на важности результатов проведенного исследования, а подробности расчетов намеренно пропущены.

I have looked through the two scientific articles written by a group of American scientists and Norwegian scholars. Both papers are devoted to molecular structure and are mostly of theoretical value. As other scientific articles their structures are very typical. Authors of both papers consider either structures of porphyrin cycles with little coordination cavity [1] or cyclescharacterized bya ruffling distortion [2]. Nonlocal density functional theory [DFT] was used to compute structural parameters and characteristics of nickel [1] and nonmetal (Si, P, Ge, As) [2] porphyrin complexes. Both papers [1, 2] present new regularities and mechanisms of the explanation of macrocycle distortion and porphyrin structure. Quantum chemistrycalculations of the twopapers suggest that empirical Hoard rule is applicable. Tables in [1] and Fig. 6 in [2] are especially important for my research because they consider information to be checked in my work. The considered papers were the first complex investigations reviewing non rigid ruffling distortion in macroheterocycles.

Еще большее внимание на важности прочитанных статей и акцентирование их использования в своей исследовательской работе заметно в следующем отрывке сравнительного пересказа.

These articles are very closely connected to my scientific work. I've studied supercritical water with Car-Parrinelo molecular dynamics for 2 years. In Russia we are pioneers in this area. There are only a few papers about modeling details. The first article is one of them, that is why the paper is very important for our simulations. We compared our results with the data obtained in the second and the third articles. The agreement is very good. We compute dipole moment distributions. It is very useful for predicting the structure of supercritical fluid.

Критическое восприятие прочитанного материала и умение грамотно воспользоваться полученными знаниями совершенно необходимо

будущему исследователю. Ниже приводится резюме по поводу некой интересной статьи и указывается на ее непосредственную связь с собственными расчетами.

The authors generated several versions of the Vanderbilt potentials for oxygen, with different cutoff radii to test how the transferability and plane-wave convergence properties depend on these parameters. The results are presented in Table 1. Moreover, the authors checked the convergence of three potentials as a function of plane-wave cutoff for the case of free oxygen atoms. The results are shown in Figure 1. This figure is the most important for us because we computed 32-water molecule systems with the help of Vanderbilt ultrasoftpseudopotential and norm-conserving pseudopotential of Trullier-Martins. We obtained the same dependence. Particularly, the new Vanderbilt potential is converged by about 25 Ry while norm-conserving PP requires a cutoff energy larger than 100 Ry. The present scheme also allows forces the atom to be calculated efficiently and without approximation.

Таким образом, при обсуждении любого научного источника следует помнить, что сначала дается извлеченная информация в логичном, сжатом, емком виде, а затем обязательно приводится собственное суждение и вывод о возможном практическом приложении прочитанного материала.

ВОПРОСЫ И ЗАДАНИЯ

1. **Differentiate the section of a scientific paper according to the information mentioned in the following sentences**

Meanwhile, the purified natural graphite offers a cost-effective alternative to the high quality synthetic graphite.

This suggests that expanded material, which is composed of randomly oriented single "ultra thin" graphene layers lead to more isotropic conductivity and increased particle-to-particle contact surface when formulated with electrode active materials in the battery electrodes.

We use the purest available flake of 98% C minimum as a starting material for our purification process.

The ring is essentially planar, with the peripheral phenyl rings twisted out of the ring plane to avoid contact with the adjacent CO ligands.

The NMR data of the apparently pure red product were unexpectedly complicated and it was noted that the crystals were of two distinct forms – blocks and needles.

A number of significant changes have happened recently in the graphite industry, which serves the conductivity enhancement battery market.

The typical expanded graphite particle morphology can be seen at Fig. 2.

The influence of chitosan and hydroxypropyl cellulose content on the process of swelling in the water and water vapor transport in mixtures with cellulose diacetatewas investigated.

This is due to the practical use of complexation reactions in nonaqueous and mixed solvents, and it has the theoretical interest to examine the relationship and thermodynamic characteristics of solvation processes in solutions.

The constants of protolytic equilibria glycylglycine and constants stability of its complexes with nickel (II) were determined by potentiometric method with using a pair of glass and silver-chloride electrodes in aqueous-ethanol solutions in the composition range from 0.00 until 0.55 mol.% EtOH at ionic strength 0.1 M ($NaClO_4$) and T=298K.

Glycylglycine (the firm "Fluka"), perchloric acid (chemically pure grade), sodium hydroxide (chemically pure grade), recrystallized sodium perchloric were used.

Bile pigments and their linear and cyclic analogues are an extremely interesting family of compounds with a unique set of physical and chemical properties, which determine the biochemical functions and practically useful characteristics of these compounds united under a common name "linear oligopyrroles".

The concentration of $H_2O_2$was determined by spectrophotometric titration by the reaction H_2O_2 with $KMnO_4$ in the presence of concentrated sulfuric acid according with the methodology.

Free albumin in solution is stable for more than a day.

On the basis of spectral and kinetic data one can suggest the following scheme for the oxidation processes.

During the oxidation of hydroquinone and albumin, as well as its complex with bilirubin in the absorption spectra a new band corresponding to the complex of hydroquinone and albumin is observed, i.e., hydroquinone can take some binding sites on albumin.

2. **Translate the following sentences into English.**

Получены кинетические кривые сорбции ионов Fe^{3+} на исходной и на Na-обогащенной глине.

Обнаружено, что максимальное поглощение ионов железа наблюдается за первые 30 минут адсорбции, а сорбционное равновесие устанавливается через 60 минут.

Показано, что в течение 90 минут сорбции снижение содержания ионов железа в модельном растворе произошло в 7,1 раз по сравнению с исходным.

3. **Read the following descriptions of academic papers. What do they have in common? According to what criteria can these articles be compared?**

The first paper, called the "Floating Electrode Dielectric Barrier Discharge Plasma in Air Promoting Apoptotic Behavior in Melanoma Skin Cancer Cell Lines", widely reported on the problem of the influence of the discharge of floating in air on the cancer cells of the skin.The achieved results suggest that plasma-solution treatment of tumor cells lead to their significant reduction and partial disappearance.This is evidenced by numerous data presented in tables and graphs discussed in this article. This issue is very urgent in our time because studies of cancer cells take up a lot of scientists around the world because of their low scrutiny. As a conclusion the author points out that the possible selection of the conditions is necessary for apoptosis in cancer cells.

The second article, called "Applied Plasma Medicine", brings to us the information about more general problems of plasma-solution systems in medicine, not only the destruction or reduction of cancer cells, as well as new methods of sterilization of medical equipment, preparation of medicines and much more. The action of the discharge in plasma-solution systems for biological environments in most cases is not limited to thermal treatment but also participates in the physical and chemical transformations and various processes of revitalization and modernization solutions and surfaces, directional change in the properties of drugs.

4. **Compare the *Experimental* parts of the two scientific papers given below. Name the questions to be investigated. Speak on their similarities and differences**.

J. Chem. Thermodynamics, 41 (2009) 522-524: *The mass fraction purity of each material is as follows: 1,4-dioxane (Aldrich, 0.99+) "purum" 12-crown-*

4 (Fluka, ≥0.98) "purum" 18-crown-6 (Fluka, ≥0.99) were used as received. Anhydrous acetonitrile (Aldrich, 0.998) was further purified by the method described in the literature.

Calorimetric measurements were performed over the whole mole fraction range of water in the mixture at T = (298.15±0.01) K, using an "isoperibol" type calorimeter as described in the literature. The calorimeter was calibrated on the basis of the standard enthalpy of solution at infinite dilution of urea (Calorimetric standard US, NBS) in water at T = 298.15K. The value obtained from 10 measurements in this study was (15.30±0.07) kj·mol (literature data 15.31 kj·mol, 15.28 kj·mol. Thus, the uncertainties of the measured enthalpies of solution did not exceed ±0.5% of the measured value. Six to eight independent measurements were carried out for each investigated mixture. There is no dependence of the solution enthalpy of the examined cyclic ethers on concentration within the correlation range used for the cyclic ethers in a mixture with a given composition. For this reason, the values of the standard solution enthalpy (Δ H) in all the systems under investigation were calculated as mean values of the measured enthalpies. The results obtained are presented in table 1.

ThermochimicaActa 444 (2006) 13-15: *18-crown-6 (1,4,7,10,13,16-hexaoxacyclooctadecane) (MP Biomedicals), D-glucose, D-galactose, ... (Fluka, >99% pure) were used without further purification. All chemicals were dried in vacuum at 323K (crown ether) and 343K (monosaccharides) during several days before use. Solutions were prepared by weight in doubly distilled deionized water.*

Enthalpies of solution of 18-crown-6 in different monosaccharide-water mixtures were measured with an isoperibol calorimeterat 298.15. The amount of 18-crown-6 in glass ampoule was ≈0.02g. The ampoule breaking-heat effect was negligible. The uncertainty in the measured enthalpies was estimated to be

±0.6%. The solute molality in all cases was estimated to be ≈1x10^{-3}mol kg^{-1}, which can be considered as infinitely dilute, and the measured enthalpies of solution were regarded as standard enthalpies of solution. The obtained value of the standard solution enthalpy of 18-crown-6 in water is in a good agreement with literature data.

5. **Change the following sentences using the participial construction.**

In the complexes of both types, the central ion is coordinated by four donor atoms belonging to two chelate fragments of the molecule. In the case of M(acacen), these fragments are bonded through the ethylene bridge.

6. **What is wrong in the following sentence?**

All three Ni(acacen), Cu(acacen), and Zn(acacen) complexes (Table 4) have C_2 symmetry and identical within the error limits bond lengths in the organic ligand.

7. **Give your opinion on the following extract. Name its structural function.**

Review of the known biochemical and medical studies has shown that significant progress in understanding the biochemical functions of bile pigments made over the past 10-15 years was reached. In particular, the notion of bilirubin as a ballast product of hem metabolism and toxic agent was supplemented by new information that a normal physiological concentration of a pigment in the tissues and organs are vital. Recently attention of scientists drawn toward the study of photoreceptoric, regulatoric, and especially the antioxidant functions of bilirubin, which is clinically shown in a variety of pathological conditions such as ischemia-reperfusion injury, atherosclerosis,

hemorrhagic stroke, anaphylactic reactions, and chemical mutagenesis. These findings may lay a foundation for new treatments for cardiac, cancer and neurodegenerative diseases. Noticeable, according to a series of biomedical research, bilirubin is an antioxidant, working in the cardiac muscle and nervous tissue. As compared to porphyrins, bile pigments are oxidized in much milder conditions, which is due to the lack of molecules of the latter macrocyclic effect.Under the influence of various chemical and physical factors irreversible oxidation of linear oligopirrols occurs and investigation in this field is a very urgent task due to the reasons listed below.

8. **What are your suggestions to simplify the sentence?**

At the same time, in zinc bis-complexes the closed spherically symmetric $3d^{10}$ subshell of the central ion loses the ability to stabilize the planar structure, and donor O atoms of two bidentate ligands are located in mutually perpendicular planes (Fig. 7) providing the smallest Coulomb repulsion between them (the $Zn(acac)_2$ complex has D_{2d} symmetry).

9. **Reformulate the sentence so that it sounds like a conclusion.**

In the studied Zn(acacen) complex, the dihedral angle between two N—Zn—O planes is 43° and it reflects the impossibility for two chelating ligand fragments to occupy a mutually perpendicular position, as should have been expected for the zinc coordination compound with two independent bidentate ligands.

10. **Suggest all possible changes for the sentence to become a topic one.**

For illustration of structural features of tetra-coordinated zinc complexes we compare the geometries of four free molecules: $Zn(acac)_2$, Zn(acacen), Zn(salen) and Zn(saloph) (Figure 8).

11. **Change the following sentence using the infinitive construction.**

It was established that, in general, Zn complexes have a tendency to a pseudo-tetrahedral conformations because spherical closed d^{10}- shell of ion zinc loses the ability to stabilize planar structure but the repulsion of ligands favors their perpendicular orientation.

12. **Formulate the following sentence as the conclusion; make your suggestions to shorten it.**

On the whole receivedexperimental dataallow revealingquantitative redistribution between individual forms of the adsorbed hydrogen caused by the displacement of the superficial balances due to the action of a solvent as a principal cause of solvents nature and structure influence on the laws of hydrogen adsorption on the skeletal nickel.

13. **Give your criticism on the following final passage. Characterize the investigation undertaken; give as much information as possible**.

The solvents nature and structure influence on the laws of hydrogen adsorption appeared to be caused by the changes in the sizes and heats of the adsorptions, adsorptive factors of individual forms of the adsorbed hydrogen, and also the change of entropy and normal affinity of adsorbate as a result of structure arrangement of a metal surface and its specific solvation by solvent.

Задания для самостоятельного написания
чернового варианта научной статьи:

1. ***Название*** статьи должно быть четким, описательным, не слишком длинным. Как правило, название для статьи подбирается после написания чернового варианта.

Писать его рекомендуется сразу же на английском языке, так как при переводе русскоязычного текста на английский будут доминировать лексико-грамматические особенности родного языка [5]. При изложении своих мыслей на английском, напротив, вспоминаются клишированные фразы и стандартные конструкции иностранного языка, поэтому такой текст будет легче исправлять.

2. ***Введение***: во-первых, дать четкое представление о природе и степени изученности рассматриваемой проблемы; во-вторых, привести относящиеся к делу достижения других ученых в этой области; в-третьих, показать, как предпринятое исследование расширит и углубит имеющееся знание. Гипотезу и цели сформулировать в конце *Введения*. (3 параграфа)

Примерный список некоторых стандартных фраз[62]

для написания раздела *Introduction:*

A. ***To give the historical background of the investigation and to formulate the problem:***

- *During the past decade there has been increasing research into…*
- *In some theoretical studies…*
- *… were able to provide a fully generalized, compact simultaneous solution to the problem of …*
- *In particular, they employed … for…*
- *… is an important and common problem.*
- *In the previous paper … we used a specific model for…*
- *The paper examines a method for…*
- *Earlier descriptions of the … assumed that…*
- *However, detailed experimental studies of … indicate that…*

[62]См.также: *Academic Phrase bank.* URL: www.phrasebank.manchester.ac.uk

- *The most rigorous treatments available are restricted to the …*
- *Accordingly we suggest that…*
- *Several techniques have been used to investigate…*

B. ***To make a brief review of related literature:***

- *There is a wide body of literature which suggests that…*
- *There was the limited number of studies conducted on…*
- *Extensive field studies were undertaken by the scientists at …*

C. ***To justify the need for your investigation:***

- *Thus, … has received little attention.*
- *It is therefore important to establish…*
- *Studies on the … process have been and still are of interest because of the fact that …*
- *In spite of significant recent advancement in the fundamental understanding of … several important aspects of the… still remain controversial.*
- *…investigations have been proved very valuable in … but they do not give a complete picture of … since they eliminate…*
- *Most of the above investigations concentrated on the general effects of … and did not look carefully at the…*
- *There is still lack of knowledge of… Much further research is needed to understand…*
- *There is still no complete knowledge of…*
- *There are still many gaps in our knowledge of the problems of…*
- *We still know very little about the origin of…*

D. ***To state the purpose of the research:***

- *Theobjective of this study is…*
- *… is the primary purpose of the paper.*
- *The aim of this paper is to investigate the…*

3. ***Материалы и методы***: включить в этот раздел информацию в таком виде, чтобы ее мог воспроизвести любой ученый; дать точные названия материалов и оборудования с указанием производителя и поставщика; логично описать методы и способы получения данных;объяснить модель эксперимента; указать особенности и специфику исследования. Уместно привести таблицу или схематическую диаграмму для объяснения порядка выполнения процесса. (3 параграфа)

Примерный список некоторых стандартных фраз

для написания раздела*Experimental*:

- *The experiments were performed at…*
- *The experimental set-up included…*
- *Two array configurations were used.*
- *The measurements … were conducted using…*
- *The main experimental configuration is presented in Fug. 1.*
- *The simulation starts with…*
- *The instrumentation and general arrangements were those described previously.*
- *All the experiments were carried out using…*
- *A standard two-compartment electrochemical cell with a volume of 50 ml was used to…*
- *The velocity distribution in the… is obtained numerically using the finite element method.*
- *The equation governing the direct problem is obtained by…*
- *The direct problem is solved using … method.*

- *The following procedure is used to determine…*
- *… was verified by measuring the … at various axial locations.*
- *The device was similar in concept to that described by …*
- *The probe itself consisted of …*
- *… was recorded by the computer for a set sampling rate and time.*
- *The outside diameter of the tube is taken to be…*
- *… under steady state conditions.*

4. ***Результаты***: наглядно представить основные итоги работы; привлечь таблицы и рисунки со значимыми легендами; выстроить логическую связь между результатами и ключевым направлением исследования. (5 параграфов)

Примерный список некоторых стандартных фраз

длянаписания раздела *Results*:

- *The results of … numerical calculations are shown in …*
- *Results indicated that …*
- *A schematic diagram of the system shows that … (Fig. 1).*
- *There is good agreement between the experiment and theory for… (Fig. 5)*
- *The data cover a wide range of … dimensions and operating conditions.*
- *When the same data (Fig. 3) … were compared to … it appeared that …*
- *The discrepancy between the equation and the data obtained suggests that …*
- *The present correlation is in good agreement with most data.*
- *We can make several observations.*
- *Prior to applying the universe procedure to experimental results …*
- *Two key observations can be made from these plots.*
- *Table 4 reviews the results …*
- *Results of the … summarized (Table 4) indicate that …*

- *As expected the … errors decrease with … more rapidly.*
- *The fact that the … errors are larger than the … errors suggests one of the two things.*
- *Similar observations can be made about the behaviour of the mean errors.*
- *In general there is no significant qualitative difference between the … and … cases.*
- *The data are plotted in logarithmic form for ease of comparison with … paper.*
- *On the basis of these results it can be stated that …*

To describe results use tentative verbs and modals:

It appears/seems/is like that …
These results suggest …
It is possible that …

5. ***Обсуждение***: представить принципы, механизмы, взаимосвязи, объясняемые полученными результатами; указать совпадение или расхождение с предыдущими данными; обосновать возможность теоретического и практического применения результатов. (3-5 параграфов)

Примерный список некоторых стандартных фраз
для написания раздела *Discussion*:

- *This research has attempted to …*
- *The original assumption was that …*
- *The findings of … suggest that … is appropriate to …*
- *Analogous results hold for …*
- *One reason could be that …*
- *These results could be explained by assuming that …*
- *It is unlikely that …*

- *These findings suggest/imply/provide evidence that …*
- *Detailed understanding of … is still lacking.*
- *The method becomes even more efficient for the … case.*
- *From a computational view point …*
- *More significant though is the relative ease of implementing the … model involving …*
- *In this context, the results are the same as those obtained from the … method.*
- *The methods described here have more general application …*
- *It was observed that … does not have a significant effect on the performance of the … equations.*
- *The principal results and findings are as follows.*
- *Analyses of experimental data obtained during … demonstrate that the inverse procedure is capable of accurately predicting measured … over significant periods of time.*
- *The results from … were compared with the results from …*
- *The model will be useful in the analysis of … processes.*
- *A significant advantage of this theory is that …*
- *It should be noted that the results recorded here are very preliminary.*
- *Finally, an important conclusion follows from …*
- *It is a logical consequence of the fact that …*
- *It would be interesting to …*
- *Much further research is needed in the area of …*

6. ***Заключение***: обобщить наиболее значимые выводы; оценить вклад в научную картину мира; указать возможные перспективы и направления. (1 параграф)

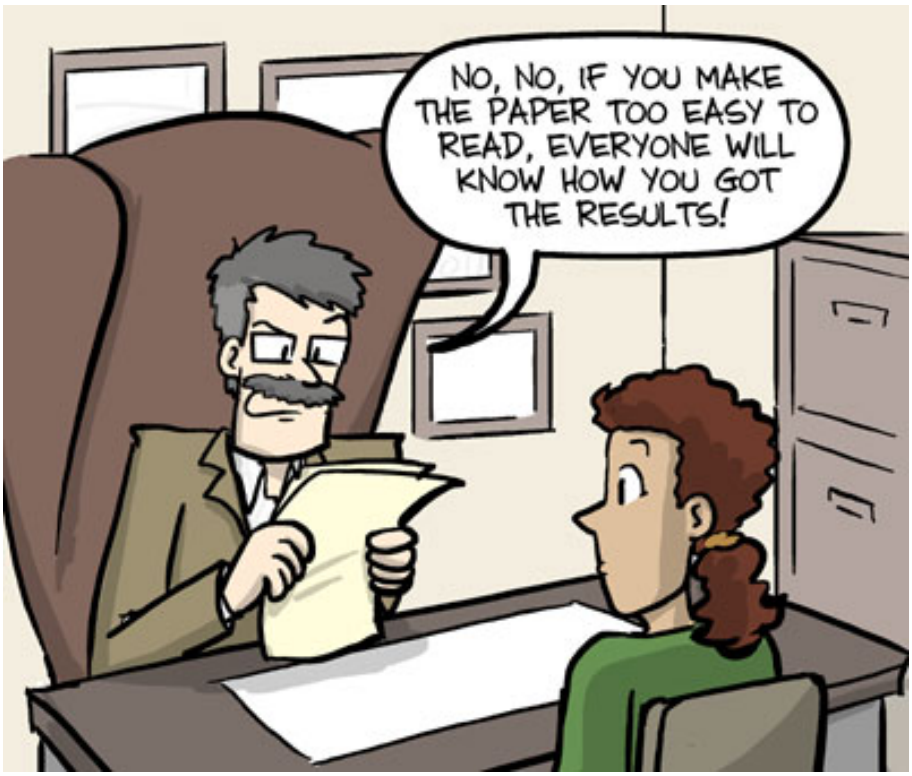
7. ***Благодарности***: указать имена, источники финансирования исследования и официальные названия учреждений

Примерный список некоторых стандартных фраз

для написания раздела *Acknowledgments*:

- *We appreciate helpful discussions with … and … This work was supported by the … under Grant No. …*
- *The author is grateful for Grant No. … from …. I thank … and … for supportive comments, constructive suggestions and discussions.*
- *The authors wish to express their sincere thanks to … and … for their invaluable assistance in … and for their penetrating criticism.*

8. ***Список использованной литературы***: оформить в соответствии с соответствующим ГОСТ.


NO, NO, IF YOU MAKE THE PAPER TOO EASY TO READ, EVERYONE WILL KNOW HOW YOU GOT THE RESULTS!

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СПИСОК АКАДЕМИЧЕСКИХ СТАТЕЙ, ИСПОЛЬЗОВАННЫХ В КАЧЕСТВЕ ПРИМЕРОВ

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МОДЕЛИРОВАНИЕ АКАДЕМИЧЕСКОЙ СТАТЬИ НА АНГЛИЙСКОМ ЯЗЫКЕ ЧЕРЕЗ АНАЛИЗОРИГИНАЛЬНЫХ ХИМИЧЕСКИХ ТЕКСТОВ

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