

# Essay guide

## KJM3070

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*Here we are going to discuss the formal requirements that are required to write a scientific report. In addition we will attempt to provide some guidance to the practical task of the assignment.*

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## 1. FORMAL REQUIREMENTS

We focus on the quality of the work, not the quantity. A short good report is considerably better than a long poor report. Correct use of the references and references citing will be taken into due consideration during the evaluation of the report. References should be as up to date as possible and contain relatively new research reports and/or articles. A balanced usage of different sources of information is desired. The report should have a “red thread”, preferably in the form of a specific problem or issue that is answered or responded to in the conclusion. The text should be focused on the issue at hand. Include only relevant material and investigate only the information that is related to the problem.

### 1.1. References

What are your thoughts, point of views, ideas, and what information was brought in by the references should be made clear and obvious. Refer precisely from where the information was found. This is not easy but it is an important part of the assignment. This is solved in the text by referring to a literature list. All the references cited in the text should be enrolled in the list. There are many ways of referring to references; e.g. giving the name of the author and publishing year or by using index numbers. We use author’s name and publishing year as shown in the example below, since the numbering type is not practical in a group work.

Examples for using of author’s name and publishing year:

*Sullivan et al. (1986) pointed out in an investigation that Al chemistry in fact has more aspects than what is commonly relayed in text books (see Stumm and Morgan, 1981). A number of articles also pointed out that the soil characteristics is important (Nørdo, 1997; Sullivan et al., 1986). Our opinion is that the coffee price in Denmark is important in this context. But R. Vogt (pers. comm.) does not agree to that. He refers to a report prepared by Norwegian pollution control (SFT) which obviously concludes that the coffee price in Norway is of no importance to the Al chemistry (SFT, 2003).*

We see that only the family name of the author is used. When there are two authors, both their family names are used. When there are more than two, only the family name of the first author is used followed by *et al.* One can use the name of the institution in charge of the publication if the author's name is not given. If there are many articles published in the same year for the same author, one can use a, b, c etc. after the year. Remember that this should be done in agreement to the literature list. All references that are mentioned in the text should be written the literature list and vice versa.

Literature list (arranged in alphabetic order)

- Article in book: Nordø J., 1977. En statistisk undersøkelse av surheten i en bekk nær Birkenes i Aust-Agder. In: Rosenqvist, I.T. (Ed.) Sur jord - surt vann (Acid soil - acid water), Ingeniørforlaget, Oslo.
- Report: SFT, 1996. Utredning av effekter av kaffeprisen i Norge og i utlandet på Al kjemien. Resultater 1980-1996. Statens forurensningstilsyn (SFT) Oslo.
- Textbook: Stumm, J.H. og Morgan, J.J., 1981. Aquatic Chemistry. Wiley Interscience, New York. 780 pp.
- Scientific paper: Sullivan, T.J., Christophersen, N., Muniz, I.P., Seip, H.M., and Sullivan, P.D., 1986. Aqueous aluminum chemistry response to episodic increases in discharge. *Nature*, 323: 324-327.
- Per. comm.: Vogt, R.D., Pers. Comm., Dept. of Chemistry, Univ. of Oslo, P.b.1033, 0315 Oslo.

## **1.2. Layout**

The front page should contain the title, name of authors and the publication year. The text should be typed using Times New Roman 12 point, single line spacing, on numbered pages. Text should be written in plural form- or passive tense. Tables and figures are to be inserted into the text and made understandable by means table or figure text alone. The figure text should be written below the figure while the table text should be placed above the table.

## **2. DISPOSITION OF THE REPORT**

Usually a scientific publication has a structure that is different than that in a criminal novel. Here the evidences and solutions should be uncovered as early as possible.

A report should in content begin more generally (wide) and finish rather specifically (limited), while in term of extent, it should be begin with little text and end with much text. This is an advantage both for you who are going to write the report and for the reader. If the report is not limited enough before discussion, the group will soon drown in literature searching.

## **Key words**

Provide key words or short phrases (maximum of 6), in alphabetical order, suitable for indexing.

### **2.1. Abstract**

Provide a short abstract of 100 to 250 words. The abstract should not contain any undefined abbreviations or references.

### **2.2. Introduction**

Here the problem should be defined and the topic should be delimited. How the problem/topic fits into a large perspective and what it is that render it to be important or interesting should be explained and clarified. The introduction should contain a short summary of the given problem/scientific field by quoting central literature. This may be managed in a chronological manner. In the introduction the theme may be dealt with in a general manner, but the amount of text should not be more than 20% of the report. The literature that is used for writing the introduction is usually taken from review articles, text books and reference books. Since the content of the introduction is usually generally accepted facts, one can generally use "The material is mainly collected from Hansen et al. 1990 and Olsen 1991". It can be assumed that the reader has a general knowledge about the problem. An extensive introduction of textbook knowledge is therefore not required.

The introduction should be ended by a short text that describes the purpose of the report. What is the new information in this report that does not exist in other available reports?

### **2.3. Main part**

The main part should contain compiled material from reports, web pages, investigations and research articles. Information should include results from research front, but at the same time it should be understandable by any person that has some chemical education.

One should only include material that is relevant for the issues of the report so that the mentioning of the "coffee price in Denmark" is avoided. Some reports tend to just be lists of facts without any obvious aim or goal. This is not good as the reader can not absorb such information. The text should only handle the most important and relevant information. The purpose is to compile all relevant information for the topics under consideration. Reports that lack central parts of the problem picture and instead focused on facts that are of less importance, express poor investigation work. Therefore it is significant for the group to define a "red tread". Sometimes the group face failure when the group members do not agree on the delimitation of the subject. It is better that every group summarize the limitation of their study and then collect and interpret the information from different sources. The group should be objective. Large tables can be put in an appendix. In the text only a subset of the data should be presented.

It is important for the reader that the material is logically built up. The line of arguments should be discussed clearly in the group before distribution of work between the group members.

Every environmental problem has many different sides and aspects. We should focus on the environmental chemical aspects of the problem. The political, economic and ethical aspects can be discussed, but should not dominate in the work. Chemical equations which related to the discussed theme can be added to the text.

## **2.4. Conclusion**

One should try to answer possible problem aspects in the conclusion. The group may try to evaluate the problem based on information from reports considered together with new information from research reports. The group should be neutral and not dogmatic. Every member can contribute with their own speculation but without giving daring conclusions that can not be proven or documented thoroughly.

## **3. GENERAL GUIDANCE**

### **3.1. Structure and distribution of the work**

Begin by dividing the report into relevant sections. Give each section a title. Arrange these titles in logical order and so that some of them are sub-sections. You have then made an outline or framework in the form of a table of contents. To distinguish between chapters and sub-chapters, we suggest that you use the system used in this document. The report usually should consist of three main chapters that were described in chapter 4.

### **3.2. Literature collection**

The most time consuming part of the work is getting assistance from specialist and collecting all the relevant literature. Our experience tells us that there are many similar classes that are dealing with project studies related to environmental problems. This has made scientific experts in the governmental offices such as SFT, Statistical central bureau (SSB) and Ministry of environment (MD) to try to avoid students asking questions. This is not good, but nothing you should care about because their role as governmental employees is also to provide you with the information you request. They will help willingly if you know how to contact them in suitable time. Remember that these experts are busy people, so do not waste their time. To prepare for a good visit you should make a list of useful and interesting questions. This will motivate the expert to provide you with the required information. Start early with the collection of information for the assignment. It may take some time to order reports.

Information collection plan:

- 1- Define the problem or subject area.
- 2- Contact the lecturer or other scientific expert in the field of the subject. See in the lecture plan if there is a lecturer that covers your subject. You can also ask the persons responsible for the project assignments or at the reception desk of the dept. of Chemistry about who covers the relevant field of chemistry.
- 3- Contact the relevant lecturer and ask him/her for interesting angels to the subject and ask for articles or references which are related to your subject.
- 4- Before indulging in an extensive literature search you should delimit your study.
- 5- Use the Sci-Finder and libraries both in the university and in the research institution that are specialized in your subject (e.g. SINTEF, NIVA etc.). Study the reference list in the articles that you already have. The university library and the library at the Dept. of Chemistry subscribe to most online scientific journals. By use of e.g. Sci-Finder you can seek out relevant literature and download pdf files of articles dating back to 1997. If what you are seeking is older then that you may be lucky and find that the local libraries also subscribe to the paper copies, dating further back. If you still did not find what you need in the institution library, the librarian can help you to find them in other libraries. By using internet sites; <http://www.ub.uio.no> and

<http://www.bybysis.no> can you search for relevant books, reports and journals. <http://www.scholar.google.com> is also a good searching site for interesting subjects.

- 6- Read only what is relevant to your work.
- 7- Prepare a list of questions and then contact the relevant lecturer or expert again. Ask also whether he/she know other people that can help you getting the information you seek.
- 8- Before visiting an expert outside of the university you may ask them to send you articles, reports etc. so they need not spend time to explain the material in these documents. If you are able to present yourself well, you will receive a good response. Remember to mention to them that you are a student at the Dept. of Chemistry at the University of Oslo and that you are taking an environmental chemistry course, and that YOU HAVE SELECTED the theme.
- 9- It is advisable to choose a subject where someone in the group has special contact or first hand knowledge.

### **3.3. Writing process**

In addition to communication, writing has an important function as a tool for structuring your thoughts - idea writing. Writing lets you develop and clarify the ideas. A written paragraph is not only a product of ideas but it is an access towards new ideas. It is wrong to think that a good writer is one that first think the thought through and then translates the thoughts into a proper written text. Writing is a non-linear process. The writing process is a reiterated and cyclic process, where there is continuous exchange between planning, writing and rewriting. These processes are taking place all the time and on different levels, from spelling and word choice to the content and build up of the text. Rewriting is a consequence of the development of thought and thereby an integrated part of the writing process.

Think thoroughly through paragraphs classification. A paragraph constitute an idea block; to write a paragraph is important for developing and building up thoughts, and the paragraph gives important signal to how the reader should interpret the text.

A common problem is that one becomes lost in the material one is writing, without knowing where one has been or where one is going. A good solution is to prepare a short outline (not only key words) that is used during different stages of working with the text.

As a writer we read our own text with comprehension. We read in the text our intentions and logic – not necessarily what we actually have written. I.e. we see blind to ourselves. It is therefore always good to get an outsider to read the text to see what knowledge and information that can be difficult for the reader to understand and where in the text we need to express our meaning more explicitly. Another option is to let the text rest for a while before approaching it again. Write the first draft of the text. Then read through the text and correct any mistakes. Read the text again next day to cheque if it still makes sense. After a week the text should be read again so that biased reading of the text is avoided.

Strive to write in short concise sentences, though avoid a Ernest Hemingway style. In that way one avoids ambiguous and circumlocution formulation. Do not copy-paste a large part of other's work in your text. Write down instead the meaning with your own words.

Although the text delivered to the group is just temporary, it should look good and be easy to read. The content, outline and literature references should be presented in their right places.