Instructions for writing a scientific report

1 INTRODUCTION

These instructions are for writing a scientific report for laboratory work at the Department of Chemistry, University of Jyväskylä. Instructions are based on Instructions for writing a scientific thesis[1]. Both instructions and other useful guidelines are available on the website of the Department of Chemistry (Hyödyllisiä linkkejä ja materiaaleja — Kemian laitos (jyu.fi)). The structure, content and writing of scientific reports is additionally taught in the Introduction to Laboratory Work (KEMA200) and Reporting Communication (XYHM1011) courses.

Laboratory work requires always studying the work, theory, safety and doing preassignments before going to laboratory. Performing a laboratory work on schedule also requires a plan. The plan includes schedule for various experimental stages, consideration of safety of different reagents and methods and doing all the necessarily mathematical calculations for reagents. Careful familiarization with the work makes the writing of report easy.

In addition to preparation of the laboratory work, time is required to write a report. The credits of the laboratory courses include independent work where for instance writing report is included. Writing the report is strongly encouraged to start immediately after the experiment is finished or already during the experiment if the it takes longer. This way the work is still fresh in mind. In addition, some things can still be checked such as reagent information.

The aim of this guideline is to define the general content of the report and layout of the report. In addition, the instructions clarify some of the practicalities related to the report. It should be noted that emphasis of different sections of report varies in different laboratories, research fields and courses. It is important for the student to understand that the instructions for report also vary in work places. For example, scientific journals have their own guidelines for writing articles. Companies can have also a very specific guidelines or templates for reporting the results. The model may vary within a company, for example, the customer's version may be different that the one left to the company.

The idea is that student will apply the instructions together with teacher, supervisor etc. The aim is to write a coherent, clear and readable description of the work and results. In addition to the content of the work, structure, unity and language are very important for understanding and repetition of work. Report is written in Finnish or English.

The report is an accurate and precise description of the laboratory experiment. The report contains work-related theory, the actual laboratory work (methods, experiments, parameters and reagents), the results, analysis and conclusions. The aim is to link the theory and results into coherent unity. The idea is that another chemist should be able to understand the theoretical background, the purpose of the work and importance of the results. Another chemist should be able to repeat the experiments and measurements based on the report.

The length of report varies depending on the work and the results. There is no definite rule for the number of pages of report. The general rule is that report is summarized presentations of the work. For instance, laboratory work instructions are not copied to report. However, the experiments are described in own words. The text should be appropriate academic English or Finnish. The aim is to achieve a logically structured report.

The writing of the scientific report will be dealt with the help of examples in the following pages. The report is written using a word processor program (e.g. LibreOffice, Word or LaTeX) and using variety of drawing and numerical data processing programs.

2 GENERAL CONTENT OF THE REPORT

The report should contain the following parts:

A. Cover page
B. Abstract
C. Table of Content (long reports)
D. Abbreviations (long reports)
E. Introduction
F. Theory
G. Method and Results
H. Conclusions / Summary
I. Literature / References
J. Appendices

A. An example of a cover page is presented in Appendix 1.

B. The abstract is a clear and concise (max. 1 page) description of the purpose of work, methods, results with error limits and conclusions. The abstract is an independent part of the report from which the reader is intended to gain an understanding of the content of the whole report. The page number is visible from this page onwards. Page numbers are marked with the small Roman letters. Cover page (i) and one blank page (ii) are counted for page numbering, but they are not visible.

C. The table of content (page number iv) presents the structure of the report with chapters and page numbers (Appendix 2). The table of content is generally used in long reports only. The idea is to facilitate the understanding and divisions of report.

D. A list of abbreviations or symbols (page number v) used in the report are presented after the table of content. Abbreviations and code names are explained as a list. In addition, the abbreviations and code names are explained to a reader when they are mentioned for the first time in the main text. Abbreviations and symbols are generally included in long reports only.

E. Introduction is the first chapter of the report. Introduction discusses the topic and the purpose on a general level without going into the details. In addition, the course (code, name) and the time point (semester/date and year) is mentioned at the end. Introduction is the first title to be numbered. The page numbers are marked with Arabic numbers from hereon.

F. Theory includes the theoretical background of the work, such as phenomena and methods of the work. The idea is to link the theory to the experimental part. However, the theory section does not include experiments, but they are presented on a general level. In addition, equations, reactions and literature values are presented here. Equations and reactions are numbered and explained. All the symbols and units are also explained. The reactions and equations are cited according to their numbering later in the text.

G. Methods and results section contains information on the used reagents, equipment, methods, measurement data, observations, calculations, results and possible error calculations. Reagents (formula, M, manufacturer, purity) and equipment (manufacturer, model etc.) can be presented in tables. Syntheses, methods and measurements together with the findings are described in detail. Pictures and/or schemes can be used in order to help description. Measurement data and results are presented clearly, for example, in tables. Example calculations are provided for the analysis of the results. One example of each type of calculation is presented. In addition, error calculations are presented and explained here. The aim is that another chemist can repeat the work based on this part. Therefore, great attention should be paid to the precise, clear and logical reporting of the experiments and results.

H. Conclusion/Summary presents the main conclusions and the most important numerical results together with errors. Results are compared with the literature values. The aim is also to consider the success of the work and possible sources of error. Significance and applicability of the results is also discussed. Conclusion/Summary resembles the abstract but it is broader. Critical review of the results and realistic consideration of the success of the work is important.

I. Literature/References are presented at the end of the report before the appendices. The main text should have references as superscripted running numbers.

J. Appendices that are relevant to the work, such as a laboratory notebook, spectra, large tables and measurements results, are placed to the end of the report. Appendices are listed, titled and numbered after references. Each attachment is displayed on their own page after the list. The number of the appendix is placed up on the right side of the first page of the appendix (APPENDIX X, X = the number of the appendix).

3 LAYOUT AND TYPOGRAPHY

3.1 General layout

The report is written in the size A4 with following layout:

Margins
right and left 2.5 cm
top and bottom 2.5 cm

Page numbers
top, middle

Font and spacing
Times New Roman, black, 12 pt
Spacing, 1.5 pt

Sections
The text is justified.
Paragraphs are separated by one empty line.

Chapters
Times New Roman, black, 14 pt, bold
Two empty lines before title
In numbering of headings no more than four numbers are used (e.g.. 3.2.1.1).

Highlighting in *italics* or <u>underlined</u>
Molecular numbering in **bold.**

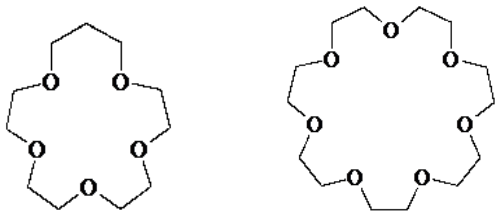
Those using LaTeX may use common sense in layout. Please follow the general instructions on the order of presentation and aim for a clear layout. The page layout of LaTeX is usable as it is, but may be changed closer to these instructions. Use common sense.

3.3 Figures, tables, reaction equations and equations

Figures and tables are one way to report results. They can be used for instance for depiction phenomenon, presenting equipment and results in report. The idea is that figures and tables support the text, the presentation and understanding. They should be uniform in style, clear and easy to understand. The most important and useful figures and tables are included in the text. They are placed clearly in the context of the text after the actual topic has been presented. Large figures and tables can be included as appendices.

Figures and tables are numbered logically and referred to in the text with the corresponding number. The reference is usually presented in parenthesis at the end of the sentence, which addresses the topic of the presentation. In addition to the numbering, figures include also a caption ending with a full stop (see Figure 1). Both the figures and captions are centered. The figure caption is separated from the main text by one empty line. Figures and tables should be drawn by oneself with the help of graphical chemistry programs. For example, chemical structures can be drawn with the ChemDraw software. If something is directly reproduced from a publication, a citation to original source must be added into the caption. In addition, a permission for reproduction should be requested from the publisher and the corresponding copyright information must be added to the caption.

For example:



1 **2**

Figure 1. Two crown ethers, 16-Crown-5 (**1**)[2] and 21-crown-7 (**2**).[3]

Reports can also include plots that are presented as figures. The axes of plots are clearly marked with names or symbols and units. Plot should be scaled in order to facilitate visualization of shapes and data points in the plot. In addition, the distribution of tick marks in the axes should adjusted to increase readability of the plot. Measured data points are connected by lines only if it clarifies the plot or if there is physical reason. Using lines is not recommended in other cases. Tables, plots (presented as figures) and analysis of results is done using, for example, Origin, GnuPlot, LibreOffice Calc or Microsoft Office Excel software.

Tables have numbers and captions that are placed above the table. Table captions are aligned left. Tables and captions are separated from the main text by one empty line before and after the table. The layout of the table should be clear and simple. Therefore vertical and horizontal lines should be kept at minimum. Each row/column should have a heading . In addition,

symbols and units should be presented. Footnotes may be added under the table with the small font size, for example 10 pt, to clarify the contents of a table. Table and its caption should appear on the same page. The layout of the page depends from the size of table. For broad tables, horizontal page layout can be used. In other cases layout is vertical.

For example:

Table 1. Standard molecular entropy $S^{o}(298\ K)$ of some compounds and elements[4]

Compound (standard state, 298 K)	$S^{o}(298\ K)$ / J $mol^{-1}K^{-1}$
C (diamond)	2.4
Ag (crystalline)*	42.6
I_2 (crystalline)	116.1
HBr (gas)	198.7
PCl_3 (liquid)	217.1

*This is an explanation for silver.

Reaction equations and other equations are placed individually on own rows and centered. Equations are part of text and they should be connected to the subject. Numbering of reactions and equations are presented in left in brackets. Reaction equations are numbered using (R1), (R2), etc. Reactions and equations including symbols and units are explained. Units are generally written with sub-/superscripts instead of fractions in order to obtain evenly spaced rows. Equations are added using Equation editor of the word processor software. All variable, for instance *E*, *V* and *p*, and constant, such as *R* and *F* should be presented with italic font type in equations, text, graphs and tables. However, text-based subscripts (e.g. reagents, products), units (e.g. kJ, K), chemical symbols (e.g. NaOH, Na^+), logarithmic notations (log, ln) and other mathematical operators are presented with normal font. In addition, many established notations, such as pH and pOH, are presented with normal font.

For example:

The reaction equation for a neutralization reaction of sulphuric acid with sodium hydroxide is presented as

$$H_2SO_4\ (aq) + 2\ NaOH\ (aq) \rightarrow 2\ H_2O\ (l) + 2\ Na^+(aq) + {SO_4}^{2-}(aq)\ . \qquad (R1)$$

Equation of ideal gas is

$$pV = nRT, \quad (1)$$

where p is pressure (Pa), V is volume (m^3), n is molar amount (mol), T is temperature (K) and R = 8.31447 $JK^{-1}mol^{-1}$ is the molar gas constant.

3.4 Results and accuracy

The measurement data and other numerical values are presented with a reasonable accuracy and errors / standard deviations, if possible. Results are given with as many significant digits as the most inaccurate value has. Therefore the context of values has to be considered. For example, 200 milliliter volumetric flasks with accuracy of 200.00 ± 0.01 ml are to be used in the lab practical according to instructions. In this case, number 200.00 has five significant digits. The zeros in the beginning of decimal numbers and at the end of integers are not significant digits. For example, numbers 12340, 123400000, 0.001234 ja 0.0000001234 have four significant digits, whereas 1234.00 has six significant digits. Please note that a dot is used as a decimal separator in the English language and comma in the Finnish language.

So-called 15-unit rule is used for determining the reporting accuracy of the results in the chemistry and physics lab reports. According to this rule, the inaccuracy of significant digits of the results should not exceed 15 units. The reporting accuracy is determined from the error. When examining the following result s = (5.234 ± 0.071) m, the significant digits of the error are first identified. The significant digits of the error (±0.071 m) are 71, which is greater than 15. Therefore, the error must be rounded up to ±0.08 m (errors are always rounded up). Now the significant digits of the error are 8, which is less than 15. The result is then reported with the same number of significant digits after the decimal point and rounded according to the normal guidelines to 5.23 m. Then the final result with error according to 15-unit rule is s = (5.23 ± 0.08) m.

3.5 Errors

Errors occur during all measurements and values are not absolute. All results have certain accuracy that depends, for example, on the method, equipment and user. The accuracy of graduated/measurement equipment is stated on them. This should be observed and marked in

the lab notes. For instance, graduated flaks can have marking of 50 ± 0.08 ml, In 20°C. This means that the volume of flask is between 49.92 – 50.08 ml when temperature of the liquid and flask is 20°C. In addition, equipment and different methods have their own accuracy. This means how close to actual real result they can get in certain circumstances (concentration, temperature).

3.6 Tense

The report is written in passive voice. The tense of report varies in the different part of report. Passive imperfect is used in presentation of own work (Methods and results) ("*The reaction mixture was stirred for six hours.*"). When other researchers' results are presented (Theory, Summary/Conclusions), the tense if passive perfect ("…*have presented…")*. Conclusions, explanations of figures and generally known facts are written in present tense ("The results show that the concentration increases…".).

3.7 Literature references

The reference should be added to all facts in the text that are not generally known. The references are mainly books, scientific articles/publications, patents and regulations. In addition, presentations and e-publications/files could be used as reference. The author should have reference to him/herself (file or paper) or the author must have read it. All reference information is clearly given. Then the reader can easily search for it and obtain it to get for more information. A reference should be the original and primary reference where the subject is presented for the first time. This is not always possible, because sometimes the reference may be difficult to find or it is written in unusual foreign language. In this case it is justified to use a reference that is easier to find or published later than the first one. Reference lists can be written in several different ways. However, the references always have the authors, source, year and page numbers. These instructions present the reference styles used at the Department of Chemistry, JYU.

The references are marked with running numbers and superscripts after the sentence or word/number addressing the topic. The same sentence/word/number can have several

references. One reference is numbered only once. If the same reference is used later in the text, the same original number is used again.

For example: This is an example, which is based on several references.[7,11-15,23]

If the whole section is based on one reference or the section is based on several references, the reference(s) can be presented in the end of the section. The reference number can also be placed in other positions in the text. For instance reference after a word/number means that publications have information about this exact word/number.

For example: The earlier studies show that the compounds can be used as a cancer medicine,[7] medical materials,[8] conductive materials[10] and in analytics[11].

If the name of the author is mentioned in the text, the reference is placed immediately after the name.

For example:

i) If there is only one author: "Shimada[2] has observed..."
ii) If there are two authors: "Armarego and Reece[1] have observed..."
iii) If there are three or more authors: "Knabe *et al.*[8] have observed..."
Note! *et al.* is usually written in italics.

If the topic is relatively common and could be found in various references, only one of the references can be chosen.

For example: "As generally known (see for example ref. 7)…"

Literature/References are presented as a list after Conclusion/Summary. This way a reader can find the original reference. The list should contain all important information of references and it should have also an uniform style. At the beginning of the studies reference lists can be typed with a word processing programs because number of references is usually small. The number of references increases in the advanced level studies. Therefore use of a reference management

programs, such as Zotero, RefWorks or Mendeley, is recommended. Department of Chemistry and University library organize courses for using reference management programs and databases, and searching information.

The list of references should contain the names of all authors, i.e. *et al.* cannot be used in the list of references. All references are presented in a uniform style. Special attention should be paid to the names of the authors, the titles of the articles and bibliographical information.

3.7.1 Scientific articles as references

1. A running number and full stop.
2. The complete last name, the initial letter(s) of the first name(s) of the author(s), possible Jr. or Sr, separated with a comma. If there are more than two authors, the names of the authors are separated with semicolon, esimerkiksi Kilmberg, M., Jr.; Klimberg, M. A., Sr.; Stilton, D. and Rehn, O.
3. The name of the article as it is written. The general rule is that the words of the title are written without capital first letters, except for the first word (Note! German articles). Depending on the chosen reference style the title of the article is not necessarily shown.
4. The name of the journal is written with *italics*. The names of the journals are abbreviated according to CAS Source Indexin (CASSI; cassi.cas.org).
5. The year in **bold**, space, *volume number in italics*, the first and the last page number separated with a hyphen and full stop. Esimerkiksi *J. Appl. Cryst.*, **1994**, *27*, 4-11. Note! Some journals do not have a volume number (for example some RSC publications). The issue number is presented only if the page numbering in each issue of a volume is started from 1.
6. If the original journal is not available or published with an unusual language, an English abstract (if available) can be used as a reference (see Example 2 below). The source of the abstract should be presented. Generally, however, it is recommended to use the original reference.

For example:

1. Armarego, W. L. F. and Reece, M., Quinazolines XXV. The synthesis of 8-chloro-2-[4-(2-furoyl)-piperazin-1-yl]-6,7-dimethoxyquinazolin-4-amine hydrochloride (8-chloroprazosin hydrochloride), *Aust. J. Chem*., **1981**, *34*, 1561-1566.
2. Shimada, K., Organic compounds in kraft bleaching spent liquors. V. Photodegradation of red-pine chlorinated oxylignin, *Mokuzai Gakkaishi*, **1982**, *28*, 376-382. *Chem. Abstr.*, **1983**, *97*, 129328v.
3. von Weizmann, G. Kubel, H. ja Lange, W., Untersuchungen zur Cancerogenität von Holzstaub. Die Extraktstoffe von Eichenholz (Quecus robur L.), *Holzforsch.*, **1989**, *43*, 75-82.

3.7.2 Books and theses (M.Sc. or Ph.D. thesis) as references

1. A running number and full stop.
2. The name(s) of the author(s) as written in the references to scientific articles. If a book is a collection of articles/chapters written by different authors and with an editor, both the author(s) and the editor are mentioned. (see example 8 below)
3. The name of the book *in italics*.
4. The edition (if not the 1st), the publisher, the place of printing, country, the year of publishing.
5. The first and the last page number, for example pp. 19-31. If the whole book is a reference, no page numbers are needed.
6. If the different parts of the same book are used as a reference, the different parts are separated with a letter in a reference. See example 6 below.

For example:

4. Kivinen A. and Mäkitie O., *Kemia*, 3. ed., Otava, Keuruu, 1981, pp. 23-35.
5. Eberson, L., *Organisk kemi*, Almqvist & Wiksel Förlag AB, Stockholm, Sweden, 1969.
6. Sjöström, E., *Wood Chemistry - Fundamentals and Applications*, 2. ed., Academic Press, San Diego, USA, 1993. a) pp. 2-14 b) 67-84 c) 101-104.
7. Jeffrey G. A. and Saenger, W., *Hydrogen Bonding in Biological Structures*, 2. ed., Springer-Verlag, Berlin, Germany, 1994.

8. Dence, C. W., The determination of lignin, in Lin S. Y. and Dence C. W. (eds.), *Methods in Lignin Chemistry*, Springer-Verlag, Berlin, Germany, 1992, pp. 32-61.
9. Kotoneva, J., *Steroidit supramolekulaarisessa kemiassa*, M. Sc. thesis, University of Jyväskylä, Department of Chemistry, Jyväskylä, 1995.
10. Leppänen, J., *Design and Synthesis of Entacapone Prodrugs and L-Dopa – Entacapone Codrugs*, Kuopio University Publications A. Pharmaceutical Sciences 59, Ph.D. thesis, University of Kuopio, Faculty of Pharmacy, Department of Pharmaceutical Chemistry, Kuopio, 2002.

3.7.3 Presentations or posters as references

Oral and poster presentations are sometimes published as a compilation or an abstract book (for example Conference Proceedings or Proceedings, abbreviated as *Conf. Proc.* or *Proc.*). When these are used as a reference the time, the place and the organiser of the conference are given. Typical abbreviations used in this context are *Int.* or *Intl.* = International) and *Symp.* = symposium. For example *Int. Symp. Pulping Chemistry*.

For example:

11. Hyötyläinen, J., Characterization of lignin and humic compounds in receiving water system of pulp industry. Use of model compounds and CuO-oxidation-HPLC-method, *Conf. Proc. TOCEON 93, Toxic Compounds in Environment*, Znojmo, Czech Republic , 1.-3.6.1993, pp. 78-84.
12. Ristolainen, M. and Alén, R., Characterization of effluents from TFC bleaching of hardwood kraft pulp, *Proc. 1996 Int. Pulp Bleaching Conf.*, Book 2, Washington, D.C., USA, 14.-18.4.1996, TAPPI Press, Atlanta, USA, 1996, pp. 523-525.

3.7.4 Other references

Unofficial sources: Other references, that should be mentioned, can include essential but unofficial sources, such as an interview with an expert or e-mail correspondence with an expert. These are special and rare references.

For example:

13. Paasivirta, J., oral statement 24.7.1996.
14. Nissinen, M., e-mail correspondence, 14.3.2010.

Computer programmes: If a non-trivial computer programme is used in the work a reference should be given. The name of the programme is written with capital letters. Many scientific programmes used in research have a specific reference that can be often found on the internet pages of the program. Reference is placed immediately after the name of the programme.

For example:

15. Sheldrik, G. M., SHELXL-97 - *A program for crystal structure refinement*, University of Göttingen, Germany, 1997.
16. Sheldrick, G. M., *Acta Crystallogr., Sect. A: Found. Crystallogr.* **2008**, 64, 112-122.

Patents: Patents can be also used as reference. They contain information for instance about properties of compounds and possible applications. Reference information is often presented on internet pages of the patent organisation.

For example:

17. Kanbe, S., Shinazaki, Y. ja Takei, K., Substituted phenyl benzoates and their use in liquid crystal composition, *Ger. Offen*, 3,001,423, 26.1.1979.
18. Pystynen, J., Luiro, A., Lotta, T., Ovaska, M. ja Vidgren, J., Cathecol derivatives, *US Pat.*, 6,150,412, 2000.

A series of a research institute or a university: Many research institutes publish different research data in their own series. Some of these series are only in electric form on internet. However, they are referred as normal publication.

For example:

19. Tuominen, I., MILOX-prosessin kemikaalitaseen tarkastelu tuotantomittakaavassa, PSC Communications 80, 28.8.1995, Oy Keskuslaboratorio- Centrallaboratorium Ab, 1995.

Laws, regulations and acts: A variety of foreign and domestic legal texts can be also used as references. Reference information should include name, code, institutions, type and year/date of the law/regulation/act. There may be more information on reference practices on the internet site of the issuing institutions.

For example:

20. Asetus talousveden laatuvaatimuksista ja valvontatutkimuksista 1352/2015, Helsinki, Sosiaali- ja terveysministeriö, 27.11.2015.

    tai

    Sosiaali- ja terveysministeriön asetus talousveden laatuvaatimuksista ja valvontatutkimuksista (1352/2015), Helsinki, 27.11.2015.
21. Terveydensuojelulaki 763/1994, Helsinki, Sosiaali- ja terveysministeriö, 01.01.1995.

Standards: A variety of foreign and domestic standards can be also used as references. Reference information should include number code, name, year and institutions. There may be more information on reference practices on the internet site of the issuing institutions.

For example:

22. SFS-EN 27888, Veden laatu. Sähkönjohtavuuden määritys, 1994, Helsinki, Suomen Standardisoimisliitto SFS ry.
23. ASTM Standard F2792-12a, “Standard Terminology for Additive Manufacturing Technologies”, ASTM International, West Conshohocken, PA, 2012, DOI: 10.1520/F2792-12A, http://www.astm.org/.

WWW-pages: A direct address of the www page can be given, if the address is informative and fully traceable. The date when the reference was taken must be given in the parenthesis at the end of the reference.

For example:

24. Agilent 7890 Series Gas Chromatograph: Advanced Operation Manual, Agilent Technologies Inc., https://www.agilent.com/cs/library/usermanuals/public/G3430-90015.pdf (28.5.2020).

3.8 Nomenclature of chemical substances and structures

Names and formulas of compounds are presented for all reagents used in work. Chemical substances and formula are named according to IUPAC rules. Trivial names may be used if the name is in general use (for example acetone). However, IUPAC name of the compound should be used, when the compound is mentioned for the first time. In the case of large and complicated systems schematic picture of a compound should be given. In this case the structure is presented as figure. The compound can be referred with number or abbreviation. The chemical structures are drawn with a special program, such as ChemDraw, using an ACS style or similar.

3.9 Units and quantities

Units and quantities are given in SI-units. Acceptable exceptions are: Celsius degree °C, litre (l), Ångström (Å), minute (min), hour (h), day (d), year (a), wavenumber (cm^{-1}) and electron volt (eV).

3.10 Specific instructions

The emphasis of different parts of report varies depending from the branch of studies. Different fields of chemistry and laboratories focus on different things. In addition, type of research results and practices are diverse. There may be some subject and laboratory specific instructions and practises available. Consult your teacher.

4 RETURNING THE REPORT

The report must be read and checked before submission. The submitted report has to be the finalized version i.e it contains all the information and results of the work. Attention must be paid to the clear and comprehensive presentation of work and results. The structure, settings such as the cover page, the blank page, summary, page numbers, paragraphs and titles, line spacing, text alignment, results, errors, figures/tables/reaction equations/equations and language must be in accordance with the instructions. If necessary, the report can be inspected with Turnitin plagiarism software.

The report is submitted for evaluation within two weeks of doing the laboratory work. Teacher will evaluate the report and will inform student about the acceptation/corrections. The correction time is one week. Submission place and manner might vary depending from the laboratory, course and teacher. Teacher of the course will give necessary information about submission and evaluation. In order to unify the evaluation, criteria have been defined in a form of table in every laboratory course that has several teachers.

References

1. Nissinen, M., Instructions for writing a scientific theses, Instructions, University of Jyväskylä, Faculty of Mathematics and Science, Department of Chemistry, Jyväskylä, 2017.

Appendices

1. Cover page example
2. The table of content example

APPENDIX 1

Name of the laboratory work

KEMXXX The code and name of the course

University of Jyväskylä
Department of Chemistry
xx.xx.xxxx (date of return)
Tero Tutkija
Teacher:

APPENDIX 2

TABLE OF CONTENTS