VYSOKÁ ŠKOLA CHEMICKO-TECHNOLOGICKÁ V PRAZE

Faculty of Food and Biochemical Technology

A Guide to Writing Final Theses at FFBT

Rules and recommendations

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Prague 2025

SUMMARY

The chapter called ‘Summary’ (‘Souhrn’ in Czech) is a brief and concise outline of the contents of your final thesis. It serves as a sort of ‘trailer’ that allows the reader to quickly understand the main objectives, methods, results and conclusions of your thesis without the need to read the whole text. It is often the first and sometimes the only part of the thesis that a person will read.

Purpose and main content

The Summary must be written in a comprehensible and coherent manner and it must make sense even without the need to read the rest of the thesis. It should not include citations, tables, complicated formulas or undefined abbreviations, with the exception of generally accepted and conventionally agreed upon abbreviations.

Structure: An ideal Summary should contain the following key parts:

Introduction to topic: Briefly outline a broader context of the topic, the current state of knowledge (state-of-the-art) and the reason why the given problem is scientifically or practically relevant.

Objective of thesis: Briefly state what you plan to investigate or solve.

Methods used: Briefly describe the main experimental or theoretical methods that you used.

Key results: List the most important and significant results of your thesis. Focus on key findings, not detailed data.

Main conclusions/contributions: Mention the most important conclusions you have reached and what the main contribution of your thesis is to the given field.

Length and style

Length: The Summary has a limited length. The total length of the Czech and English Summary must not exceed one A4 page. The recommended length is 1 400–1 600 characters including spaces.

Style: Write briefly, clearly and concisely. Each sentence should have the highest possible information value. Use a neutral and objective tone. The passive voice is commonly used in scientific writing, especially when describing methods used and results achieved. Write in the past tense, or present perfect tense (e.g. ‘new substances were synthesised’ or ‘new substances have been synthesised’ is more appropriate than ‘I synthesised new substances’).

Important notes: *Do not repeat the Conclusion:* The Summary is not a copy of the Conclusion. While the Conclusion is similar and contains the discussion of contributions and recommendations for further research, the Summary is much more condensed and is used for quick navigation.

Last written part: Although the Summary is placed at the beginning of the thesis, it is usually one of the last parts that you write. You will be able to write a short and concise text only after you have all the results and conclusions.

Note: The Summary in Czech and English must be submitted as part of the thesis and also separately in SIS. This text serves as a so-called abstract, which is always required when the thesis is being uploaded to SIS. An Abstract is not a formal part of the thesis, but it is mandatory for being able to properly submit the thesis in the system.

SOUHRN

English version of the Summary in Czech.

ACKNOWLEDGEMENT

The Acknowledgement is an optional but recommended part of the thesis. It is used to acknowledge the persons that have participated in the creation of the thesis or provided significant assistance in its preparation.

In addition to thanking the thesis supervisor (PhD supervisor), consultants, colleagues or family members, it is **advisable** – **and sometimes also necessary – to mention people** who have significantly contributed to the achieved results, for example by providing experimental data, conducting analytical measurements or consultations on processing the data. **Failing to mention this type of assistance may be considered ethical misconduct or plagiarism as the results of the thesis are not clearly attributed to concrete authors.**

The Acknowledgement should be polite and brief. It is not intended for providing assessment of the thesis or for personal messages.

Note: The Acknowledgement can include an **affiliation of the thesis** to a specific research project, grant or institution that supported the research financially (e.g. GAČR, TA ČR, OP JAK etc). If the provider requires it, you can also include the **number of the project** or its official name.

Regarding **inserted logos of organisations**, their use in the final thesis should be consulted in advance with the thesis supervisor. It is generally **not recommended to insert logos** directly in the text of the thesis, unless explicitly requested. If the use of a logo is necessary, it is recommended to place it **in the Acknowledgement** in a suitable place, ideally appropriately sized and so that it does not disrupt the overall format of the thesis.

TABLE OF CONTENTS

How to create the thesis table of contents

Note: You will find a detailed guide on how to create a table of contents in MS Word here**.**

The table of contents should be well organised, brief and structured using levels 2 or 3 of sub-headings as a maximum – however, level 2 is usually sufficient. Pay special attention to the following:

- It should not be longer than **two pages**. In exceptional cases, it may be three pages long, provided the logical structure of the thesis requires it, but this is an exception.
- Titles of chapters and subchapters should be brief – ideally fitting to one line and not being too descriptive. Long, multi-line titles make navigation in the document difficult and make it less clear.
- The table of contents should only include chapters and subchapters that are included in the text. Do not include 'Tables' or 'Figures', unless they are part of the main structure of the thesis. If it is so, it is advisable to include these overviews in the 'Appendices' section.
- Numbering style (e.g. 1, 1.1, 1.1.1) should be uniform and correspond to the style used in the text itself.

When creating the table of contents, we advise you to always check that the headings in the text really correspond to the headings in the table of contents, and that the used hierarchy reflects the logical structure of the thesis. Especially before printing or finalising the thesis, it is crucial to update the table of contents to make sure that the chapter titles and page numbers correspond to the final version of the document.

Note: The table of content should not include complicated formulas or undefined abbreviations – with the exception of generally accepted and conventionally agreed upon abbreviations.

TABLE OF CONTENTS

1 INTRODUCTION

Introduction is a key part of the final thesis. Its purpose is to introduce the reader into the topic in a brief, clear and expert manner. It should be written so that it can be understood also by people who are not experts in the given topic but are familiar with the given field

1.1 What should Introduction include

Brief introduction to the topic: The author should clearly state what the thesis is about, in what context the chosen topic is important and why they want to explore it. It is recommended to briefly explain why this topic was chosen and what its significance is within the given scientific or specialised field.

Overview of existing results and state of knowledge: It is recommended to summarise in a few sentences what has been discovered or published in the given field so far – e.g. basic principles, approaches or significant papers.

Problem definition and motivation for solution: It must be explained what concrete problem or issue the thesis intends to address, or what gap in knowledge or practice exists.

Stating the thesis objectives: The objectives must be defined in a clear, specific and concise manner. For longer theses (e.g. Master's theses) it is advisable to distinguish between main and partial objectives. This section may also include the tested hypothesis or research question provided formulating a hypothesis is relevant for the thesis. The hypothesis should logically follow from the stated context and topic introduction.

Outlining the methodological approach: At the end of the Introduction, explain what methods or strategies will be used to achieve the thesis objectives – but not in detail. The details will be provided in Methods.

Note: The Introduction is not the place where you give a theoretical analysis or presentation of results. It should be brief, motivating and readable to provide the reader with a basic framework for understanding the subsequent text.

1.2 General instructions

A Bachelor's thesis, Master's thesis and dissertation is an official document with which the student concludes their studies at UCT Prague. The thesis must comply with the formal and content requirements set out by the Faculty of Food and Biochemical Technology (FFBT).

This document summarises the basic general principles for the preparation of final theses (FT). The individual departments may provide additional or slightly different instructions that reflect the specifics of the given field. Therefore, we always recommend that you consult the specific requirements directly with your supervisor or consultant. The student must state all the obtained results in the final theses in accordance with the instructions of the supervisor of the final thesis (FT). **The results published in the final thesis must be true.**

Use of software tools and artificial intelligence in writing final theses:

- Due to the increasing availability and use of software tools for creating and editing texts (including the so-called 'artificial intelligence'), it is important to adhere to ethical and professional standards when using them. General guidelines for using AI in writing theses are provided here: Using software tools for creating and editing texts ('artificial intelligence') – *Can artificial intelligence tools be used in writing*?)
- Instructions for authors of Bachelor's theses, Master's theses and dissertations.

1.2.1 Page setup

All final theses must be written in A4 format with a uniform margin setting of **25 mm on all sides**. This setting is also sufficient for potential double-sided printing. However, if you choose different left and right margins, you would have to set different values for odd and even pages for double-sided printing.

Bachelor's and Master's theses are typically printed single-sided (with text only on the right side of the page). In justified cases, a thesis may also be printed double-sided, provided clarity, readability and correct page layout are maintained (e.g. the main chapters should not start on the left side).

Dissertations are usually printed in a B5 format, which is done by reducing an A4 printout – the reduction is done by staff at the printing office. In order to check the layout, you can print the document reduced to approximately 80 %

A brief summary of the setup can be found in **Tab. 1.1**, the recommended length of theses and the individual sections can be found in **Tab. 1.2, 1.3, 1.4**.

Table 1.1: The basic page setup for Bachelor's theses, Master's theses and dissertations. *For table and figure captions, use the 'Figure and Table Caption' style. For the text in the table, use the 'Text in Table' style*

	Bachelor's theses	**Master's thesis**	**Dissertation**
Margin size	25mm	25mm	25mm
Format of page (setup in editor)	A4	A4	A4
Format of page for printing	A4	A4	A4/B5*

* The staff in the printing office will resize the format from A4 to B5. For preview/check, adjust the print size to ca 80%.

1.1.2 Page layout in thesis

The bound final thesis (Bachelor's thesis, Master's thesis, dissertation) must be assembled in the following order:

Table 1.2: Introductory unnumbered pages – number of sheets

Final thesis at FFBT	
Title page (generator of title pages for final theses)	1
Bachelor's thesis/Master's thesis/dissertation assignment *(Original or quality scan of original)*	1
Statutory declaration *(It is part of the title page generated in the system. It must be **signed by hand and dated**. It is not valid without a signature and date.*	1
SOUHRN (summary in Czech) + SUMMARY (English)	max 1
Acknowledgement	1
TABLE OF CONTENTS	1–2

The structure of the text of the final thesis is regulated by the instructions for preparation of Bachelor's theses, Master's theses and dissertations of the given department where the student prepares and defends their thesis. These instructions should be consulted with the thesis supervisor before the student starts writing the thesis.

Table 1.3: Structure of text of final theses at FFBT.

FFBT	
1 INTRODUCTION	
2 CURRENT STATE OF KNOWLEDGE IN THE FIELD	
3 EXPERIMENTAL PART	3 RESULTS AND DISCUSSION *
4 RESULTS AND DISCUSSION* (or 4.1 Results and 4.2 Discussion)**	4 EXPERIMENTAL PART
5 CONCLUSION	
6 REFERENCES	
7 LIST OF ABBREVIATIONS	
8 LIST OF SYMBOLS (optional chapter)	
9 LIST OF TABLES (optional chapter)	
11 APPENDICES (optional chapter)	

* The chapter on *Results and discussion* is the core of the thesis. It contains **clearly arranged experimental results**, their **interpretation, evaluation and comparison with the literature**. The aim is not only to describe what has been done, but above all to **explain the significance of the obtained results** and show how they contribute to the solution of the given problem. ** The chapter on *Results* contains **facts without their extensive interpretation**. The aim is to clearly present **what was found**, not why. The *Discussion* chapter deals with the **interpretation and evaluation of the results** presented in the previous section. In this chapter, the student demonstrates the ability to **compare their own results with data in the literature**, **explain the differences and possible causes of the deviations, formulate conclusions arising from the obtained results** and possibly **suggest further steps or possible applications of the given research**.

The *Discussion* chapter includes a critical assessment of results and their confrontation with the findings included in cited specialised literature – at least 1 page of text in a Bachelor's thesis, at least 3 pages in a Master's thesis.

Note on the structure of the Experimental part and Results and discussion chapters:

The way in which these chapters are arranged and structured varies according to the practices of the given field, workplace and the recommendations of the supervisor. In fields focused on organic and bioorganic chemistry, it is customary to first present chapter *3. Results and discussion*, which contains an overview and interpretation of the experimental data obtained, and only then a separate chapter *4. Experimental part*, which describes in detail the used materials, methods and experimental procedures.

On the other hand, in biochemical, biotechnological and analytical fields, it is customary to use a reversed order of chapters, i.e. *3. Experimental part* followed by *4. Results and discussion*. Moreover, at some workplaces, this section is usually subdivided into two separate chapters, i.e. 4.1 *Results* and 4.2 *Discussion*, the former focusing on the overview of measured data and the latter on their critical evaluation and comparison with the literature.

The choice of the structure should align with the practices in the given field and should always be consulted with the thesis supervisor.

Table 1.4: Recommended length – number of pages in theses

	FFBT		
	Bachelor's thesis	**Master's thesis**	**Dissertation**
SOUHRN + SUMMARY (total)	1	1	According to instructions of individual study programmes.
1 INTRODUCTION	1–2	1–2	
2 CURRENT STATE OF SOLVED PROBLEM	Length of BT according to practices in the field and agreement with supervisor (usually 5–10 pages)	Length of MT according to practices in the field and agreement with supervisor (usually 10–20 pages)	
5 CONCLUSION	max. 2	max. 2	
Total length of thesis	max. 30 pages *	Length of MT according to practices in the field and agreement with supervisor (recommended 55–80 pages) **	

*The number of numbered pages refers to the main text of the thesis, i.e. the part starting from the Introduction chapter to the Conclusion chapter, excluding appendices and the list of references. **The recommended number of numbered pages refers to the main text of the thesis, i.e. the starting part from the Introduction chapter to the Conclusion chapter, excluding appendices and the list of references.

1.3 Numbering of pages

Pages are numbered using **Arabic numerals**, **centred at the bottom** of the page. The pages are numbered starting with the page **following the table of contents** – i.e. the page where the I**NTRODUCTION** chapter begins on page **1**. The sections before that (e.g. title page, statutory declaration, acknowledgement, annotation, table of content) is **not included in the numbering of pages** and the page numbers are not displayed on them.

1.4 Formatting and using styles

All basic styles (headings, text, notes, lists etc) are predefined in the **thesis template**. Font size and type, alignment, numbering of chapters and subchapters are set according to uniform rules. Do **not change** these parameters – they ensure a uniform appearance of theses across the faculty. For clear formatting, use the Heading 1, Heading 2, Text, List, Image caption etc styles. This will ensure correct content generation and visual uniformity. Instructions on how to use predefined styles in Word can be found here.

The basic recommended font size is **12 points** and it is recommended to use a **serif font** (e.g. Times New Roman). For **dissertations**, also smaller font size can be used – **11 points**.

Further: *Line spacing:* 1.5; *Alignment:* justified; *Paragraphs:* no indentation, separated by **a 6-point space**; *Use style* **'Normal'** and the predefined styles listed in **Table 1.5**.

Note: If you change the size of the basic font used in the text (e.g. to 11 pt), you need to adjust the tables and figures styles accordingly.

1.5 Numbering of chapters and subchapters

A correct numbering and formatting of chapters ensures a logical structure and easy navigation in the text of your thesis.

1.5.1 Chapter layout and formatting

New page for main chapters: Each main chapter (e.g. 1, 2, 3) begins on a new page.

In case of double-sided printing make sure that the main chapters begin on the right (on an odd page). This is a standard typographic rule for book layout.

Headings format:

The title of the main chapter is in CAPITAL letters and in bold (e.g. **1 INTRODUCTION**).

The titles of subchapters and sections are in lower case, with a capitalized first letter and in bold (e.g. **2.1 Experimental procedures**, **2.1.3 Synthesis of the intermediate**).

Note: Headings should not include undefined abbreviations, with the exception of generally accepted and conventionally agreed upon abbreviations (e.g. DNA, NMR).

1.5.2 Numbering system

Decimal classification: The numbering of chapters and subchapters is in the form of decimal classification (e.g. 2.1, 2.1.3). This system allows for a clear hierarchical organisation of the content.

No point after the number: There is no point after the last numeral (e.g. 2.1.3, not 2.1.3.). This is common practice in scientific texts.

1.5.3 Content definition and division

Chapter vs paragraph: A short statement or a single paragraph does not replace a chapter. If the text consists of only a few sentences or a single paragraph, do not create a separate numbered chapter for it.

Unnumbered subheadings: In addition to numbered chapters, unnumbered subheadings can also be used. These are suitable for:

- **Note:** To highlight important information.
- **Division within a longer text:** For better structuring and legibility of longer, but not sufficiently extensive sections to form a new subchapter. In this case, use the **'Heading 4'** style **in italics** (or equivalent formatting, e.g. *bold italics*).

Table 1.5: Main predefined styles

Name of style	What it is used for	How to refer to it in text	Note
TextDP	Plain text		
Heading 1	Titles of chapters	**Chap. 18**	12 pt for Bachelor's theses, Master's theses and dissertations in B5 format / 11 pt for dissertations in A4 format
Heading 1 unnumbered	Titles 'List …'		
Heading 2	Titles of sections	**Chap. 1.1**	
Heading 3	Titles of paragraphs	**Chap. 1.1.1**	
Heading 4	Division within paragraph		not included in the Table of Contents
Caption	Captions for tables, schemes and figures	**Tab. 1** **Scheme 1** **Fig. 1**,	11 pt; numbered continuously; do not shorten the title and always align to the left; **Figure 1: Scheme 1:** always below the figure and scheme, and the title **Table 1:** always above the table; the figure and table must always have a caption
Text in table	Text in tables		left-aligned (if necessary, adjust manually), single line spacing
Equation	Equation on a separate line	**Eq. (1.1)**	alignment two tabulators from the left
List	List of used symbols, used abbreviations, tables		same as Normal, but line spacing 1 without separation of paragraphs
Appendix	Various appendices (e.g. spectra)	**Appendix** 1	11 pt; title **Appendix 1:** caption always above appendix; always left-aligned

Note: Figures, schemes, tables, sections, paragraphs and equations are referred to directly in the text (*in unabbreviated form*) or in parentheses always after the full stop (*in abbreviated form*, see **Table 1.6**). References must be **in bold**.

Examples:

Referencing in text:

As evident from **Figure 3**, the reaction yield increases with temperature. The mechanism is shown in **Scheme 2**. The measurement results are provided in **Table 4**. The detailed procedure is described in **Chapter 2.3**. **Equation 5** expresses the relationship between concentration and time.

Referencing in parentheses after full stop:

The reaction yield increases with temperature. (**Fig. 3**) The reaction proceeds in two steps. (**Scheme 2**) The measured values are summarised in a table. (**Tab. 4**) The measured values are summarised in a table. (**Table 4**) The synthesis procedure is described in a separate section. (**Chap. 2.3**) The dependence of the concentration on time is described by an equation. (**Eq. 5**) The comparison of both samples is shown graphically and in a table. (**Scheme 7, Tab. 6**)

1.6 Brief instructions on how to write scientific text

When writing scientific chemical and mathematical texts, use consistent terminology, chemical nomenclature, legal SI units, and follow the principles of scientific publishing. For more see: Baysinger B., Pienta K. *ACS Style Quick Guide to Scholarly Communication,* DOI: https://doi.org/10.1021/acsguide

1.6.1 Quantities and units

The basic rule for quantities and units is **CONSISTENCY** throughout the thesis and respecting professional recommendations.

1.6.2 Spaces

A **fixed space** (a non-breaking space, often Ctrl+Shift+Space in text editors or Alt+0160 on the numeric keypad) is always used between the number and the unit symbol. This ensures that the number and unit remain on the same line and are not separated.

Example: 10 g (not 10g), 25 °C (not 25°C), 5 mol/l (not 5mol/l).

1.6.3 Numbers

Use **decimal point**, not a comma for decimal numbers in English.

Example: 0.5 mol/l (not 0,5 mol/l).

Numerical data in the final thesis should be presented with reasonable accuracy, appropriate to the method used, the quality of the data and the significance of the given value.

- **Use only as many digits as is relevant to the accuracy of the measurement.**
- An unnecessary amount of decimal places is **inaccurate and confusing** – it does not look scientific, but unprofessional.

Example: 89 % recovery (not 89.298498%), 1.00 ng/ml (not 1.000629 ng/ml), 0.052 mol/l (if that is the accuracy of the method), 25.0 °C (e.g. when measuring temperature to the nearest tenth)

Numbers with more than four digits on either side of the decimal point should be grouped in sets of three using a thin, non-breaking space, counting from both the left and right of the decimal point. Commas should not be used as thousands separators.

Example: 15 739.012 53

1.6.4 Range

When giving a range of values, either a **hyphen with fixed spaces** (-) or a **dash without spaces** (–) is used, depending on the type of connection.

- When referring to a **range within a single unit** (e.g. pages, temperatures, time interval), it is correct to use a **dash without spaces**: 20–25 °C, pp. 5–12, 2020–2023, 5–10% yield
- In case of **connection of two separate numbers or data, a hyphen with spaces** may be used: Brno - Prague, comparison 5 - 15 mg/ml and 10 - 20 mg/ml, 1-propanol, beta-lactam

Note: In scientific texts, numerical ranges within a single quantity should be expressed using an en dash without spaces.

1.6.5 Percentages

The use of percentages in scientific texts differs from general writing. When expressing percentages, follow these rules:

Symbol %: Use a non-breaking space between the number and the percentage symbol.

Example: A yield of 95 % was achieved. The concentration of the solution is 10 % (w/w).

1.6.6 Concentration

Molar concentration

Symbol: Molar concentration (formerly known as molarity) is denoted either as mol/l or mol l^{-1}. Both versions are equivalent and correct.

The symbol M (e.g. 1 M HCl) is commonly used, but less preferred in scientific texts because it might be confused with the unit 'mega' (10^6) or with molar mass (M = g/mol). Always use a fixed space between the number and the unit!

Examples: The acid concentration was 0.1 mol l^{-1}. The reaction took place in a NaCl solution with a 2.5 M concentration. The solution contained 0.05 mol/l ammonium nitrate.

Similar to percentages, it is possible to use either the adjective ‘molar’ or the abbreviation ‘M’ with a fixed space before the designation of the substance.

Both versions are correct: We prepared a 5 M NaCl solution. We prepared a 5 molar NaCl solution.

Note: The symbol M is always written with a space after the number (e.g. 0.1 M, not 0.1M).

1.6.7 Writing compound units

Units of physical quantities composed of symbols for several units can be written in two equivalent ways. Both are correct, but each has its advantages and disadvantages:

Notation with multiplication sign:

The individual symbols are separated by an interpunct or a multiplication sign:

Example: Pa · s, kg · m^2

This method is formally correct, but due to the mandatory fixed spaces around the interpunct symbol ‘·’, the notation may be unnecessarily long and harder to align on the line.

Notation with spaces without a sign:

The units are written next to each other without the multiplication sign.

Pa s, kg m^2.

This method is clearer, it saves space and is more often used in common scientific practice, especially in tables and graphs.

Notation of units with a negative exponent

Here there are also two possible correct methods:

Fractional notation:

Example: m/s, J/(K · kg).

This method is suitable for simple units; however, for more complex formulas parentheses are needed, which can complicate legibility.

General recommendation: For simple units (e.g. m/s), fractional notation is fully sufficient. For more complex formulas, use negative exponents without fractions, as they increase legibility and clarity.

Notation with negative exponents:

Example: J K^{-1} kg^{-1}.

This notation is brief, clear and recommended by both professional typography and standards (e.g. CSN, ISO) as the preferred notation in scientific writing.

1.6.8 Temperature

Symbol: The symbol for degrees Celsius is °C. A fixed space is written between the number and the symbol.

Example: The reaction took place at 25 °C. The temperature rose by 10 °C.

Kelvin: The symbol for kelvin is K (without a degree symbol). A fixed space is written between the number and the symbol.

Example: Absolute zero is 0 K (not 0 °K). The boiling point of nitrogen is 77 K.

1.6.9 Other common units and rules

Time: s (second), min (minute), h (hour). We do not use a period at the end unless it is at the end of a sentence. There is a fixed space between the number and the unit.

Example: The reaction took 30 min. Drying took 2 h.

Abbreviations used in text

Avoid excessive use of abbreviations. Use abbreviations only when it significantly improves readability of the text and when an abbreviation appears repeatedly.

Each abbreviation must be introduced on its first occurrence – first by spelling out the full term, followed by the abbreviation in parentheses.

Example: Polymerase chain reaction (PCR) is a commonly used method…

Never introduce an abbreviation repeatedly. In the whole text, it will be introduced only once when used for the first time.

All abbreviations used must be included in the list of abbreviations (e.g. at the start of the thesis or after the table of contents depending on common use).

Note: Commonly known abbreviations (e.g. DNA, EU, NMR, WHO) do not need to be introduced or included in the list of abbreviations, unless otherwise specified.

Latin words and terminology

Latin names of biological species are written **in italics**, e.g. *Escherichia coli*.

Similarly, established **Latin terms** are often written in italics, such as: *in vitro, in vivo, et al.*, *in situ* etc.

English names of organisms

Common names of organisms are not capitalized unless they include a proper name or proper adjective.

Examples: black bear, red-tailed hawk, Norfolk Island pine

Scientific names of bacteria

In accordance with the recommendations of the International Code of Nomenclature of Prokaryotes (ICNP), scientific names of bacteria are written in italics from the rank of family and below (genus, species, subspecies): *Streptococcus pneumoniae*, *Escherichia coli*.

Higher taxonomic ranks, such as order (e.g. Enterobacterales) or class (e.g. Gammaproteobacteria), are written in regular font (not italics).

Italics

Italics is used for variables in equations (e.g. k for rate constant, c for concentration, K_M for the Michaelis constant, V_{lim} for limiting velocity), not for units.

Rules for writing stereochemical descriptors and analytical data

When describing chiral molecules, analytical results, and reaction mechanisms, follow these guidelines for proper formatting and notation:

Writing symbols for chirality, configuration and special arrangement

Italics is used for geometrical and stereochemical descriptors.

The following s**ymbols for chirality and symmetry localization** are written in **italics** because they serve as descriptors of stereochemistry or spatial arrangement.

Examples: cis, trans, E, Z, R, S, M, P, ortho, meta, para as well as *re, si, re, re*-face

Exception: Symbols D- and L- (designation of absolute configuration for amino acids and carbohydrates) is written in small caps and not in italics.

Writing the *R/S* configuration in names of compounds

In systematic chemical names, use (*R*) and (*S*) as prefixes, or with specified locants:

Examples: (*R*)-hydroxyphenylacetic acid, (*S*)-2,3-dihydroxypropanoic acid, (1*R*,2*S*,4*R*)-1,2,4-trimethylcyclohexane

Writing the D/L configuration in saccharides and amino acids

Use small caps D- and L-, no italics, a hyphen and no space between the letter and the name of the compound:

Example: 5-hydroxy-L-lysin, D-glucose.

Optical rotation

It is indicated by signs (+) or (–) in parentheses, without a space and separated from the name by a **dash**.

Examples: (±)-4-(2-aminopropyl)phenol, (+)-glucose, (–)-tartaric acid, (–)-D-fructose

1.6.10 Other linguistic and style rules

Names of enzymes and biological terms

Use uniform names ending in **-ase**: alcohol dehydrogenase, DNA-polymerase, ribosome

If you use a **trivial enzyme name**, it is convenient (and often recommended) to also include **the enzyme number (EC)** in the format **on its first occurrence**:

Example: alcohol dehydrogenase (EC 1.1.1.1)

The enzyme number is obligatory on its first occurrence. It is not repeated in subsequent text unless it is necessary to emphasise a specific isoform or to distinguish multiple enzymes of a similar type.

Example of correct use: Alcohol dehydrogenase (EC 1.1.1.1) was used in the reaction. The enzyme catalysed the conversion… Alcohol dehydrogenase activity was measured at different pH…

Multiplication

For multiplication, we use ‘times’ or the mathematical symbol ‘×’, never the letter ‘x’.

Example: 10× diluted solution, the admixture was 5 times lower

Gravitational acceleration during centrifugation is written in the format:

Example: 4 000 ×g

(a fixed space between the number and ‘×g’ is recommended)

Restriction enzymes

Restriction enzymes (e.g. *Eco*RI, *Hind*III) are partly written in italics – the italics refers to the name of the organism (*Eco* = *Escherichia coli*), while the rest of the name (e.g. RI) is written in plain text.

*Example: Eco*RI, *Bam*HI

Primers

Primers are short single-stranded oligonucleotides. It is recommended to use the term ‘primers’ in the text, not ‘primers and oligonucleotides’ as if they were two different categories.

Trademarks

The trademarks ® and ™ are not used in scientific text, not even for commercial names (e.g. of instruments, sets, kits or software).

Abbreviations of reaction mechanisms

Abbreviation of mechanisms: Abbreviate reaction mechanism types (e.g. elimination, substitution) and their subtypes using **capital Latin letters and Arabic numerals**.

Examples: S_N1 (first-order nucleophilic substitution), S_N2 (second-order nucleophilic substitution)

1.6.11 Melting and boiling points

Abbreviations: Use the abbreviations **MP** (melting point) and **BP** (boiling point). The melting point is reported together with the solvent in which the substance was crystallised or measured, because the presence of residual solvent can affect the measured value.

Example: **MP** 176–177 °C (ethanol) (lit.[25] BP 175–176 °C (ethanol)), **MP** 225–226 °C (decomposition), **BP** 127 °C

1.6.12 Indicating optical rotation

Specific optical rotation: It is denoted by the symbols [α], where the indices indicate the **temperature** and **wavelength** of the light used.

Example: $[\alpha]_D^{20}$ (for the temperature of 20 °C and the wavelength of a sodium discharge lamp with a wavelength of 589.6 nm).

Measured angle of rotation: It is denoted by the Greek letter α.

Example: The angle of rotation was α = +15.2°

Units: Although values are often given without units, they are usually in units (°) $cm^3\ g^{-1}\ dm^{-1}$. Basic format: $[\alpha]_{\lambda}^{T}$ value (concentration (rounded to 1 decimal place), solvent)

Example: $[\alpha]_{D}^{20}$ +25.4 (*c* 1.0 in $CHCl_3$)

1.6.13 Nuclear magnetic resonance spectroscopy

When presenting NMR spectroscopy data, use a consistent format that includes key experimental conditions and description of signal.

Format of notation: Start with the isotope and technique, followed by the spectrometer frequency, solvent, and chemical shift (δ) in ppm. After that, for each signal state: signal type (abbreviation, e.g. s (singlet), d (doublet), t (triplet), q (quartet), m (multiplet), bs (broad singlet)), number of atoms, coupling constant (*J* in Hz, written in italics with the number of bonds) and assignment to a functional group.

Example: ^{1}H NMR (400 MHz, $CDCl_3$): δ 8.73 (s, 3H, -OCH_3), 7.50 (s, 1H, CH), 7.15 (d, 1H, *J* = 8.2 Hz, Ar-H), 6.3 (brs, 5H, NH and NH_2).

1.6.14 Recording data from infrared (IR) spectroscopy

IR spectroscopy results should be presented briefly, including the method of sample preparation and wavenumbers ($\tilde{\nu}_{max}$ in cm^{-1}). For significant bands you may optionally add intensity and assignment.

Example: IR (KBr, thin film) $\tilde{\nu}_{max}$: 3017, 2953 (s, OH), 2855 (s), 2192, 1512, 1360, 1082, 887 cm^{-1}.

1.6.15 Results of mass spectrometry

Mass spectrometry provides essential information on the molecular weight and fragmentation of compounds. Its results must be presented clearly and stating all relevant details. Mass-to-charge ratios and intensities of MS can be presented as shown in the following examples.

Abbreviations:

MS: mass spectrometry

MS/MS: tandem mass spectrometry

m/z: mass-to-charge ratio (written in italics)

M: molecular mass (for unchanged, neutral molecule)

M^+ or **$[M]^+$:** molecular ion (cation)

$[M+H]^+$: protonated molecular ion, **$[M-H]^-$:** deprotonated molecular ion

HRMS: high-resolution mass spectrometry. Always round the calculated and measured value to 4 decimal places.

Empirical formula (for HRMS): For high-resolution mass spectrometry (HRMS), the **calculated empirical formula** for the given ion must be provided.

Example: calculated for $C_{21}H_{38}N_4O_6S$.

Calculated value (calcd): Provide the **theoretically calculated *m/z* value** for the given ion based on its empirical formula. Values are rounded to 4 decimal places.

Example: **HRMS** (ESI) *m/z* for $C_{16}H_{22}FNO_7SNa^+$ $[M+Na]^+$ calcd 414.0993, found 414.0994

Relative intensity (optional): For MS spectra with lower resolution or to emphasise fragments, it is also possible to indicate the relative intensity of the peaks in parentheses.

Example: EIMS (*m/z*, % rel. int.): 200 (100), 185 (45), 107 (80).

1.6.16 Basic format for recording data from UV-Vis spectroscopy

Results from UV-Vis spectroscopy are reported in the form of maximum absorption wavenumbers and corresponding molar absorption coefficients.

Example: UV (hexan) λ_{max}, nm (ε): 250 (1070).

Abbreviations: λ_{max}, wavelength of maximum absorption in nanometres; ε, molar absorption coefficient

1.6.17 Basic format for recording elemental analysis

Elemental analysis should be presented with both **calculated (theoretical)** and **found (experimental)** results, with values given in **percentages (by weight)**.

'Anal.' = elemental analysis.

Example: Anal. calcd **for** $C_{45}H_{28}N_4O_7$: C, 62.47; H, 3.41; N, 6.78. Found: C, 61.80; H, 3.55; N, 6.56.

1.6.18 Recording combined analytical results

When characterising a compound, we usually collect data from several analytical methods (NMR, IR, MS, UV-Vis, elemental analysis, optical rotation etc). Presenting these data in one coherent block for each compound provides a comprehensive overview and ensures that your thesis is well organised.

Compound 1: (119 mg, 92 %). yellow, amorphous solid; **MP** 115–116 °C (ethanol); $\mathbf{R_f}$ = 0.25 (4:1 $CHCl_3$/MeOH); $[\boldsymbol{\alpha}]_{\mathbf{D}}^{\mathbf{20}}$ -17.6 (*c* 0.1 in MeOH); **^{1}H NMR** (401 MHz, D_2O, ref. ext. *t*-BuOH 1.24 ppm): δ 2.92 (dd, J_{gem} = 14.2, $J_{1´b,2´}$ = 7.0 Hz, 1H), 2.97 (dd, J_{gem} = 14.2, $J_{1´a,2´}$ = 4.9 Hz, 1H, H-1´a), 3.50 (dd, J_{gem} = 14.0, $J_{3´b,2}$ = 7.0 Hz, 1H, H-3´b), 3.58 (t, $J_{2,1}$ = $J_{2,3}$ = 9.5 Hz, 1H, H-2), 3.60 (dd, J_{gem} = 14.0, $J_{3´a,2´}$ = 4.9 Hz, 1H, H-3´a), 3.65 (dd, J = 9.5, $J_{4,3}$ = 3.3 Hz, 1H, H-4), 3.77 – 3.67 (m, 3H, H-5, H-6a,b), 3.97 (dd, $J_{4,3}$ = 3.3, J = 0.7 Hz, 1H, H-3), 4.09 (tt, $J_{2´,1´b}$ = $J_{2´,3´b}$ = 7,0, $J_{2´,1´a}$ = $J_{2´,3´a}$ = 4.9 Hz, 1H, H-2´), 4.53 (d, $J_{1,2}$ = 9.6 Hz, 1H, H-1), 7.38 – 73.1 (m, 1H, H-4-C_6H_4F), 7.55 – 7.48 (m, 2H, H-2-C_6H_4F, H-5-C_6H_4F), 7.58 (d, J = 7.8 Hz, 1H, H-6-C_6H_4F); **^{13}C NMR** (101 MHz, D_2O, ref. ext. *t*-BuOH 30.29 ppm) δ 34.56 (C-1´), 44.39 (C-3´), 61.04 (C-6), 68.74 (C-3), 69.68 (C-2´), 69.71 (C-2), 73.82 (C-4), 78.94 (C-5), 86.44 (C-1), 114.13 (d, $J_{C,F}$ = 23.5 Hz, C-4-C_6H_4F), 118.91 (d, $J_{C,F}$ = 21.3 Hz, C-2-C_6H_4F), 122.96 (d, $J_{C,F}$ = 2.9 Hz, C-6-C_6H_4F), 130.66 (d, $J_{C,F}$ = 8.1 Hz, C-5-C_6H_4F), 135.71 (d, $J_{C,F}$ = 7.3 Hz, C-1-C_6H_4F), 162.35 (d, $J_{C,F}$ = 245.0 Hz, C-3-C_6H_4F), 169.89 (d, $J_{C,F}$ = 2.6 Hz, **C**ONH). **^{19}F NMR** (377 MHz, D_2O) δ -112.78 (ddd, J = 9.8, 8.9, 5.4 Hz). **FT-IR** (MeOH) $\tilde{\nu}_{max}$: 3351, 3080, 1644, 1586, 1544, 1484, 1272, 1129, 1080, 1056, 869, 805, 681, 522 cm^{-1}; **HRMS** (ESI) *m/z* for $C_{16}H_{22}FNO_7SNa^+$ $[M+Na]^+$ calcd 414.0993, found 414.0994.

1.7 Tables

Each table **must** have a complete and self-explanatory **caption** (legend). This way, the reader should be able to understand the table's content without having to read the main text.

Tables can be numbered either consecutively (in the order in which they appear in the document) or by chapter number and the number of the table in the chapter (e.g. **Table 3.2** refers to the second table in Chapter 3). Both options are acceptable, but the second one is recommended, as it ensures better organisation.

We recommend you use automatic numbering (this ensures the list of tables can be generated automatically). In MS Word, do the following:

- click on Figure and select References from the menu / Insert Caption (see **Fig. 1.1**),
- in Label Options select type of Caption – e.g. Table 1.1. for table and select Position – the caption must be placed above the table.)

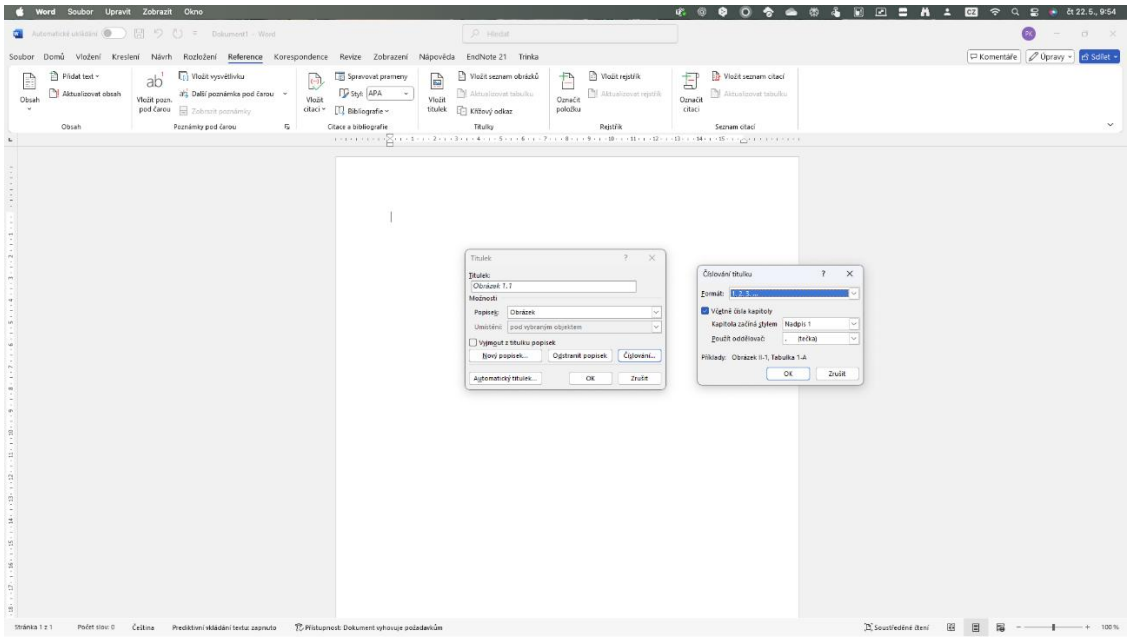

Figure 1.1: Inserting automatic captions of tables and figures

Inserting automatic figure captions

Referencing in text: Each table must be **explicitly referred to in the text of the thesis**.

The table is referred to in the text, for example, as '… stated in **Tab. 1.1** …' or '(see **tab. 1.1**)'. The name of the table is given, for example, as '**Table 1.1: First table**' (Caption style) and is

placed above the table. For the table itself, choose the table text style (font size 11 pt), and set the alignment and font style as needed.

Note: For more, see pages 8–9.

Uppercase letters in tables

In the table headers (names of column) and in the first column (row labels), we do not write entire words in uppercase letters (so-called caps) unless there is a special reason for this (e.g. an abbreviation such as HPLC).

Recommended style:

- Use uppercase first letters only where grammatically correct (e.g. proper names, systematic names).
- For common descriptive categories and variables use lowercase letters.

Not recommended: TEMPERATURE, TIME, pH VALUE (all caps – distracting and unscientific)

Correct: Temperature (°C), Time (min), pH value

Note: The style should be uniform throughout the whole thesis. Abbreviations and units are written down according to the rules (e.g. UV, NMR, °C, min, g l^{-1}).

Units in tables

When using units in tables, it is standard practice to use **parentheses**. Square brackets have a different, specific meaning.

Parentheses ( ): Usually used in column headers after the unit symbol.

Example: m (kg), t (s).

Square brackets [ ]: Square brackets are not used to indicate units in tables, graphs or the text. In technical texts and in physics, they are used to indicate the size (dimension) of a quantity.

Example: [m] = kg means that the dimension of mass (m) is kilogram (kg).

Correct use

When giving units at the header of a table or graph, it is recommended to use one of the following types of notation:

1. **Quantity (unit):** m (kg), T (°C), Time (s)
2. **Quantity / unit:** m/kg T/°C

The second type of notation is preferred in some technical and scientific circles because the expression m/kg in the table means that the value in the cell is a dimensionless number that you get by dividing the quantity by its unit.

Tables should be well organised, visually balanced and uniformly formatted throughout the thesis.

Use a suitable number of separating lines – as many as are needed to maintain legibility but at the same time for the table to not appear fragmented.

- Vertical lines are generally not recommended as they make the table looks less well organised.
- Use horizontal lines only to separate the header and the table border (e.g. top, bottom, or between the header and the body).
- The thickness of the lines does not have to be precisely defined (e.g. 0.5 pt vs 1.5 pt), but should be visually consistent – e.g. thicker outer border, thinner inner division.
- The table can continue across next page if necessary, but always make sure that the column header is repeated there and that there is no ambiguity in reading the data.

Font style in tables:

Font size: 11 pt (as an exception, 10 pt may be used for large tables, provided legibility is maintained). If the table is followed by more text, adjust the spacing above the paragraph to 6 through 12 pt to create a gap between the last line of the table and the following text. Always centre the text in the table.

Alignment and formatting of text:

Header: bold

First column including header: left alignment

Other columns of header: centre alignment

Numerical data: decimal point alignment or right alignment

Text descriptions: left alignment

Do not use italics, underlining or colour highlighting in the body of the table unless there is a factual reason for doing so (e.g. statistically significant values marked in italics – always with a legend).

Example:

Table 1.6: Concentration of analytes

Analyte	q_{sv}
hexane	0.015
benzene	2.5
methyl ethyl ketone	11
acetaldehyde	99
ethanol	1 150
methanol	1 670

Table 1.7: Total mass ($\sum\rho$) and total molar concentrations ($\sum c$) of three model mixtures.

Compound	M_r	c_I		c_{II}		c_{III}	
		mg l^{-1}	**µmol l^{-1}**	**mg l^{-1}**	**µmol l^{-1}**	**mg l^{-1}**	**µmol l^{-1}**
chlorophenol	128.6	1	7.77	1	7.77	10	77.7
dichlorophenol	163.0	1	6.13	10	61.3	1	6.13
pentachloro-phenol	266.3	10	37.5	1	3.75	1	3.75
$\sum\rho$ (mg l^{-1})	–	12	–	12	–	12	–
$\sum c$ (mmol l^{-1})	–	–	51.4	–	72.82	–	87.58

If the table is followed by more text, adjust the spacing above the paragraph to 6 pt to create a gap between the last line of the table and the following text.

If the table is too wide, it is advisable to orient it horizontally, see **Tab. 1.9**. If the table continues across next page, repeat the header and include the text '**Table x – continued**' above the table on the next page.

Table 1.8: List of compounds used in study.

Name of compound	Structure (SMILES notation)	Reaxys Registry Number	CAS Registry Number	Molecular formula	Molar mass (g mol^{-1})	InChI Key
hexane	CCCCCC	1730733	110-54-3	C_6H_{14}	86.1772	VLKZOEOYAKHREP-UHFFFAOYSA-N
propane	CCC	1730718	74-98-6	C_3H_8	44.0965	ATUOYWHBWRKTHZ-UHFFFAOYSA-N
heptane	CCCCCCC	1730763	142-82-5	C_7H_{16}	100.204	IMNFDUFMRHMDMM-UHFFFAOYSA-N
1,2-dimethylethane	CCCC	969129	106-97-8	C_4H_{10}	58.1234	IJDNQMDRQITEOD-UHFFFAOYSA-N
pentane	CCCCC	969132	109-66-0	C_5H_{12}	72.1503	OFBQJSOFQDEBGM-UHFFFAOYSA-N
octane	CCCCCCCC	1696875	111-65-9	C_8H_{18}	114.231	TVMXDCGIABBOFY-UHFFFAOYSA-N
2-methylpropane	CC(C)C	1730720	75-28-5	C_4H_{10}	58.1234	NNPPMTNAJDCUHE-UHFFFAOYSA-N
decane	CCCCCCCCCC	1696981	124-18-5	$C_{10}H_{22}$	142.285	DIOQZVSQGTUSAI-UHFFFAOYSA-N
2-methylbutane	CCC(C)C	1730723	78-78-4	C_5H_{12}	72.1503	QWTDNUCVQCZILF-UHFFFAOYSA-N
[3.3.1]nonane	CCCCCCCCC	1696917	111-84-2	C_9H_{20}	128.258	BKIMMITUMNQMOS-UHFFFAOYSA-N
2,2,4-trimethylpentane	CC(C)CC(C)(C)C	1696876	540-84-1	C_8H_{18}	114.231	NHTMVDHEPJAVLT-UHFFFAOYSA-N
2,4-dimethylbutane	CCCC(C)C	1730735	107-83-5	C_6H_{14}	86.1772	AFABGHUZZDYHJO-UHFFFAOYSA-N
3-methylpentane	CCC(C)CC	1730734	96-14-0	C_6H_{14}	86.1772	PFEOZHBOMNWTJB-UHFFFAOYSA-N
ethyl-trimethylmethane	CCC(C)(C)C	1730736	75-83-2	C_6H_{14}	86.1772	HNRMPXKDFBEGFZ-UHFFFAOYSA-N

Table 1.8 – continued

Name of compound	Structure (SMILES notation)	Reaxys Registry Number	CAS Registry Number	Molecular formula	Molar mass ($g\ mol^{-1}$)	InChI Key
2,4-dimethylpentane	CC(C)CC(C)C	1696855	108-08-7	C_7H_{16}	100.204	BZHMBWZPUJHVEE-UHFFFAOYSA-N
1,2,4-trimethylbutane	[H]C(C)(CC)CCC	1718740	589-34-4	C_7H_{16}	100.204	VLJXXKKOSFGPHI-UHFFFAOYSA-N
dimethylpentane	CCCCC(C)C	1696856	591-76-4	C_7H_{16}	100.204	GXDHCNNESPLIKD-UHFFFAOYSA-N
2,2,3-trimethylbutane	CC(C)C(C)(C)C	1730756	464-06-2	C_7H_{16}	100.204	ZISSAWUMDACLOM-UHFFFAOYSA-N
2-methylheptane	CCCCCC(C)C	1696862	592-27-8	C_8H_{18}	114.231	JVSWJIKNEAIKJW-UHFFFAOYSA-N
2,5-dimethylhexane	CC(C)CCC(C)C	1696877	592-13-2	C_8H_{18}	114.231	UWNADWZGEHDQAB-UHFFFAOYSA-N
2,3-dimethylpentane	CCC(C)C(C)C	1718734	565-59-3	C_7H_{16}	100.204	WGECXQBGLLYSFP-UHFFFAOYSA-N
2,2,3,3-tetra-methylbutane	CC(C)(C)C(C)(C)C	1696864	594-82-1	C_8H_{18}	114.231	OMMLUKLXGSRPHK-UHFFFAOYSA-N
2,2,4-trimethylbutane	CCCC(C)(C)C	1730757	590-35-2	C_7H_{16}	100.204	CXOWYJMDMMMMJO-UHFFFAOYSA-N

1.8 Figures

The same rules that apply to tables also apply to figures, with the following differences. The figure is referred to in the text, for example, as '… as shown in **Fig. 1.1**/**Figure 1.1** …' or '(**Fig. 1.1**)'. The title of the figure contains the text '**Figure 1.1**: First figure' and is placed below the figure (Title style) and should be aligned to the left. Attention must be paid **PRIMARILY** to the sufficient print quality of the figure.

Example:

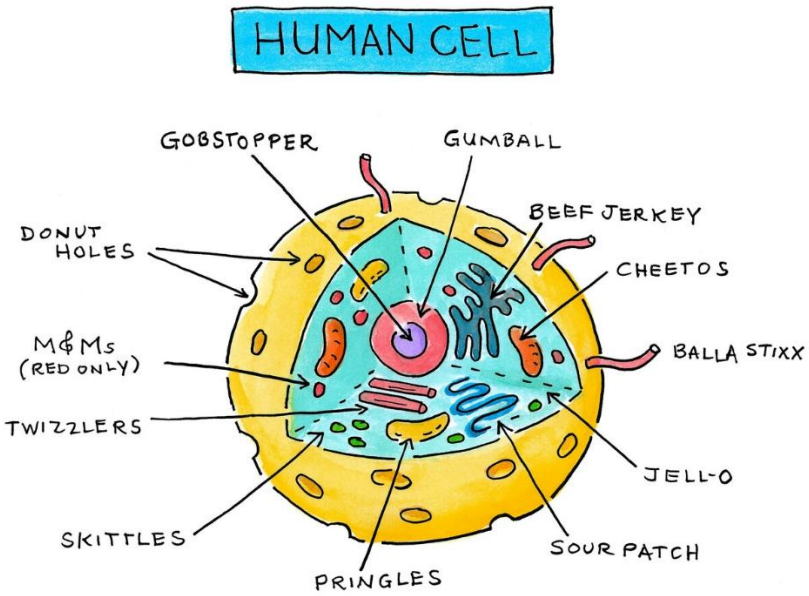

Figure 1.2: Cell structure.

General requirements

In-text references: You must **explicitly refer** to each figure and graph **in the text of your paper**.

Align figures or graphs to the centre of the page (horizontally), do not use text wrapping.

Do not insert figures with a frame or border – it is distracting.

Choose the size of the figure so that it is legible also when printed. If the figure is too wide, it is advisable to insert it on a page oriented in landscape orientation (so-called landscape format).

1.8.1 Content and legibility of graphs

Axis labels are obligatory, especially for the *x* and *y* axes – the name of the quantity and unit must always be given.

Choose an appropriate number of decimal places on the axes and for data points – typically 2–3 places, unless there is a technical reason for different formatting.

The graph legend must be clear, concise and explain all symbols, colours and abbreviations used.

The graph title is not included inside the figure – it is only included in the **caption below the graph** (e.g. ‘Figure 1.3: Methane conversion in a pilot reactor.’).

The style of all graphs (colours, fonts, line thickness, size of labels) must be **uniform throughout the thesis** to maintain visual consistency and a professional appearance.

Appearance of graphs and technical requirements

Do **not insert graphs with a frame** – a frame is distracting and does not comply with common scientific standards.

Do not use 3D effects, bold colours or unnecessarily thick lines; instead, use **simple, well-organised two-dimensional graphs**.

The graph must be inserted in a **size sufficient** to make the axes, marks, values and legend clearly legible.

Positioning of graphs in the text

The graph must be inserted **immediately after the first mention in the text**, not at the end of a long paragraph or on the next page without context.

Do not use graphs and figures with **text wrapping** – this disrupts the structure of the document and may lead to formatting errors.

The recommended alignment of graphs is centre alignment, or according to the practices of the given department.

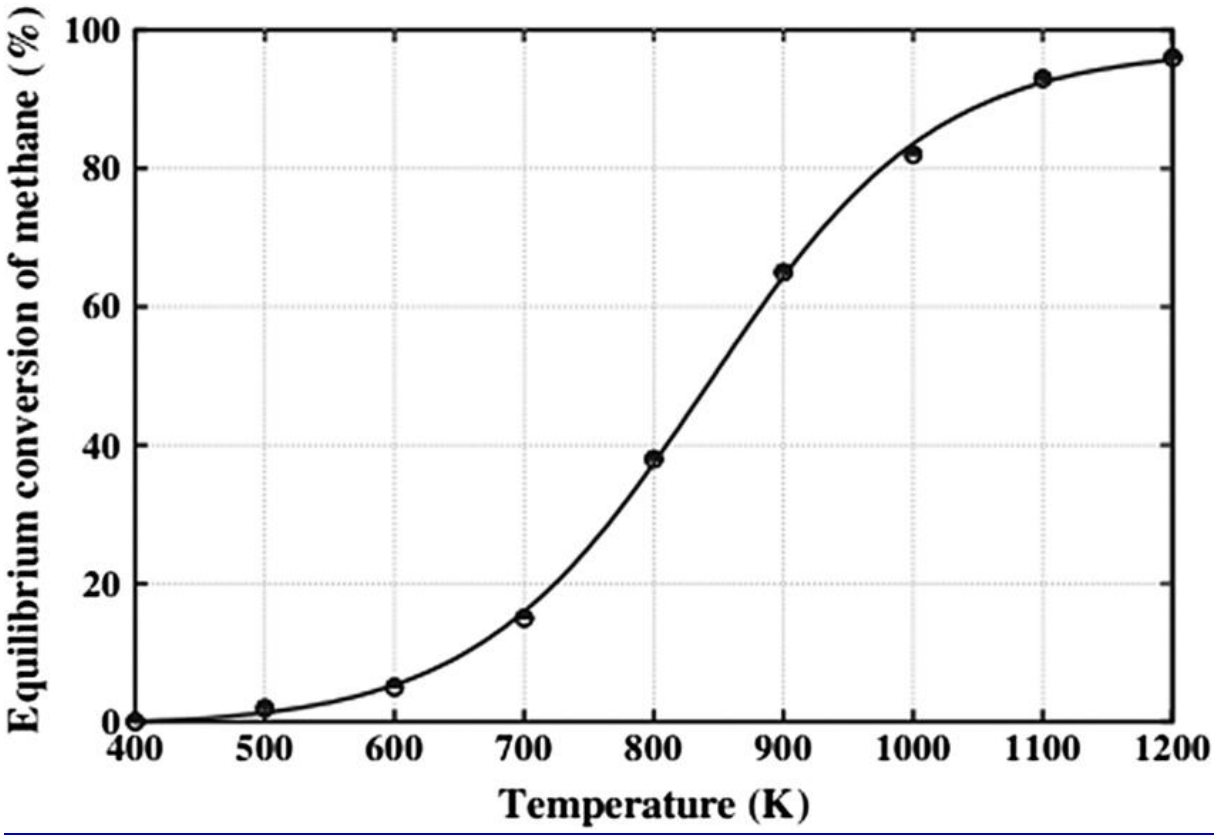

Figure 1.2: Conversion of methane in a pilot reactor.

1.8.2 Citing adapted figures

Any image or graph that is not your own original work (i.e. you have downloaded it from another publication, website, presentation etc) must be properly cited. In this way, you will show respect for copyright and allow the reader to find the original source. You can find more here: **Průvodce legálním užíváním obrazových a jiných netextových zdrojů** (A Guide to Legal Use of Images and other Non-Textual Sources)

What exactly does this mean for adapted figures.

If a figure is adapted from a source in a language other than English, there are several options to ensure that the captions are provided in English:**Recreate the figure:** This is often the best, albeit the most time-consuming, solution. The figure is recreated using graphics software (e.g., PowerPoint, Origin, GraphPad Prism, ChemDraw), and all labels, axes, legends, and captions are provided directly in English.

Edit an existing figure: If a figure must be adapted and you do not wish to redraw it, it can be edited in a graphics editor (e.g., GIMP, Photoshop) by replacing the original captions with English ones. Particular attention should be paid to the quality and legibility of the edited text.**Explanation in the figure caption:** If editing the text in the figure is technically demanding or would significantly reduce the quality of the figure (e.g. in case of very complex diagrams or photographs with captions), you may keep the original captions, but you must compensate for this by providing a proper explanation in the figure caption.

You have to: All foreign-language terms and abbreviations appearing in the figure must be explained in detail in the figure caption placed below the figure and translated into English. The explanation should be as complete and informative as possible.*Example:*

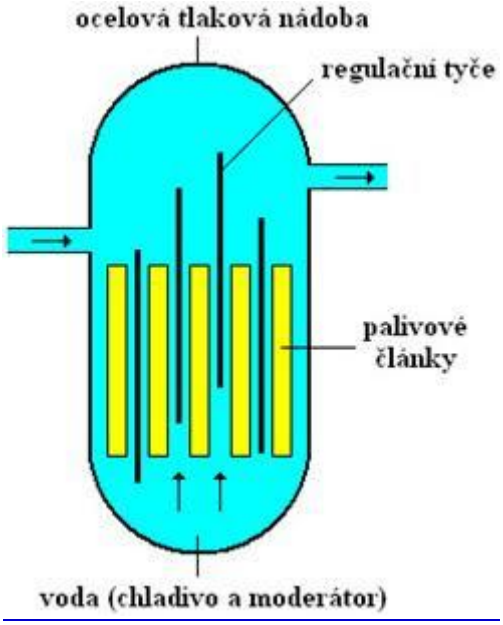

Figure 1.3: Nuclear reactor. (Adapted from [1]). Note: 'ocelová tlaková nádoba' = steel pressure vessel, 'regulační tyče' = control rods, 'palivové články' = fuel cells, 'voda (chladivo a moderátor' = water (coolant and moderator).

However, this should only be used in **exceptional cases** that are properly justifiable.

English text should be used directly in figures whenever possible. This is the only way to ensure maximum professionalism and clarity of your thesis. If you are not sure which approach is best for a particular figure, consult your supervisor.

1.9 Schemes

Schemes (e.g. reaction mechanisms, synthetic procedures, apparatus layouts) are essential in a chemistry paper work to ensure clear visualisation of complex information. They must be **consistent, precise and understandable**.

Why is an 'figure with an arrow' often referred to as a scheme?

The definition below clearly explains the main difference between a 'figure' and a 'scheme' in a chemistry paper, especially if we follow the recommendations given in these guidelines:

Figure

A figure typically depicts a static object, result or phenomenon. Examples include: a photography, a graph, a scheme of the structure of a molecule (without the reaction), a schematic scheme of an apparatus showing only the arrangement (without arrows indicating the flow of

matter or energy), a spectrum. A figure does not contain arrows indicating an action, transformation, flow or direction of a process.

Scheme

A scheme, on the contrary, depicts an action, change or relationship between elements – that is, something that is occurring or happening. A typical feature of a scheme is the presence of arrows, which may depict:

- Reaction mechanism – arrows indicating the movement of electrons or the course of a reaction.
- Synthetic procedure – reaction arrows showing the transformation of reactants into products.
- Process flow scheme – arrows showing the flow of substances, energy or information in a technological process.
- Principle of operation of an instrument – arrows showing the path of a beam, the flow of a sample or the direction of movement.

It is the presence of arrows (showing the direction of a reaction, transformation, transition or relationship between parts of a system) that is the reason why a 'figure with arrows' in chemistry papers is usually referred to as a scheme, not a regular figure.

Numbering and captions

Separate numbering: Schemes should have their **own numbering**, separate from figures and tables. That is, '**Scheme 1**', '**Scheme 2**' etc.

The caption (title) of the scheme is usually placed below the scheme itself and is aligned to the left. It does not have to include a **text description** – it is enough to include the type and number, for example:

Example: **Scheme 1** or **Scheme 1**: Total synthesis of compound X

In-text references: You must **explicitly refer** to each scheme **in the text of your paper**.

Example: ‘The reaction proceeds according to the mechanism shown in **Scheme 2**.’ or ‘The synthetic procedure is shown in **Scheme 1**.’ or ‘The acetylated methyl ester **6** was then reacted with various amines to form a series of 4-carbamoyltriazoles **7a-e**. (**Scheme 8**)’

Creation and graphic design

Use of software: Schemes should be created in professional graphics software (e.g. **ChemDraw** (preferred, recommended style: **ACS 1996**)), ChemSketch, Microsoft Visio, LaTeX with the ChemFig package for chemical schemes, or general graphics tools for block schemes).

ChemDraw: design chemical schemes/structures in **ChemDraw** using the **ACS 1996** style. DO NOT CHANGE the size or style of the scheme directly in ChemDraw – keep the default style and proportions. Resize the scheme (e.g. reduce or enlarge to align with text) only after you have inserted the scheme in Word. As a general rule, all schemes in the entire thesis should be of the **same size** to maintain visual consistency of the document.

Consistency: Use **only one software** throughout your thesis for designing chemical schemes to ensure a consistent look.

Uniform style: Maintain a **consistent style** (fonts, font sizes, line weights, arrow types) across all schemes.

Legibility: Schemes must be **easy to read** even when scaled down or enlarged. Avoid ‘visual clutter’.

Clarity and brevity: Communicate information as clearly and concisely as possible. Eliminate unnecessary details.

Colour scheme: Use colours judiciously and consistently. Make sure the scheme is legible even when printed in black and white.

Content of schemes

Reaction mechanisms: Standard symbols should be used for electrons, bonds, and arrows (one-way, equilibrium, resonance, and arrows for electron movement). Formal charges and any intermediates must be clearly indicated. Reaction conditions (temperature, solvent, catalyst) should be placed above and below the reaction arrows.

Synthetic schemes: Starting materials, intermediates, and products should be clearly indicated (**ideally with assigned compound numbers**). Key reagents and reaction conditions should be listed for each step.

Block schemes (process diagrams): Standard symbols should be used for individual unit operations (e.g., reactors, heat exchangers, pumps). Labels within blocks should be in English. Inputs and outputs must be clearly indicated.

Language and citation of adapted schemes

Language of labels: All text directly in the scheme (names of substances, reagents, block labels, axes) must be in English if the entire thesis is written in English.

1.10 Equations and formulas

Mathematical symbols and equations

In English, the decimal point is used as the decimal separator. For improved clarity, digits are typically grouped in sets of three using a thin, non-breaking space on both sides of the decimal point (and no other separators).

Example: 41 568.232 8.

For the subtraction symbol, minus, a special sign must be used − which has the same length and design as the sign +. For multiplication, use the × sign (Note: this is not a lowercase 'x'!), the multiplication dot · (Note: it is separated by fixed spaces before and after the symbol, like every mathematical sign, and thus it is not identical to a full stop), or it is sufficient to arrange the symbols one after the other (e.g. *ab*); but the product of numbers is written down as $a \times 2$ or 2×2. The asterisk, *, is definitely not a multiplication sign. Mathematical signs are always separated by a space before and after the sign, neg $2a + b = c$ or $45 \cdot 3{,}25 \neq V$.

Equations must be inserted as an object created in a mathematical editor (Equation Editor, which is a standard part of Microsoft Word) and are indicated by numbers in parentheses to the right of the formula. The same rules apply to numbering equations as to numbering figures and tables, see **section 1.2.2**. Equations are referred to in the text, for example, as '… **Eq. (1.1)** …'

or '… – **(Eq. (1.1))**'. Use the created Equation style for equations: the line containing the equation is aligned to the left and the appearance is adjusted using two tabs (centre alignment for the equation and right alignment for the equation number).

$$\alpha + \beta(\sum(a + b| \times |\sum(x^2 + y^2)) = \sqrt{\delta} + \varepsilon \qquad (1.1)$$

Chemical formulas and equations

British English spelling should be used for the names of chemical elements and compounds, in accordance with accepted chemical nomenclature.

Element symbols and compound formulas are always written in regular type (even if the text is in italics!).

The formula of one compound is always written together (without spaces, e.g. $CuSO_4 \cdot 10H_2O$, 1,2-dichloroethane). In chemical equations, the space between the numerical coefficient and the formula is always omitted:

$$H_2 \rightarrow 2\ H^+ + 2e^- \qquad (1.2)$$

For more on how to write equations, quantities, symbols and units, see:

- Julakova, E., Rovnice, jednotky a veličiny – jak s nimi? *Chem. Listy* **2005,** *99* (4), 250-257. http://www.chemicke-listy.cz/docs/full/2005_04_250-257.pdf.
- International Union of Pure and Applied Chemistry; Cohen, R., *Quantities, units and symbols in physical chemistry*. 3nd ed.; Royal Soc. of Chemistry: Cambridge, 2007, 978-0-85404-433-7. http://pubs.rsc.org/en/Content/eBook/978-0-85404-433-7.
- McNaught, A. D.; Wilkinson, A.; Jenkins, A.; Nic, M.; Jirat, J.; Kosata, B., IUPAC Compendium of Chemical Terminology – the Gold Book. http://goldbook.iupac.org.

2 LITERATURE REVIEW

The chapter 'Literature Review' is closely connected to the given topic and serves for a **comprehensive and critical evaluation** of the current state of knowledge. This part of the final thesis should demonstrate that the author is familiar with specialised literature, is able to find relevant information and data and is able to interpret and place their thesis in a broader scientific context. Before starting to write the **literature review section**, it is advisable to first **design its outline** that will help determine the logical structure of the text, the order of individual topics and the scope of individual chapters.

It is advisable to **first consult the outline with the thesis supervisor** so that it aligns with the focus of the topic, the requirements on the thesis and the expected depth of processing of individual parts.

2.1 Purpose and main content

Basic literature data: Provide basic literature data related to the theme of your thesis in a coherent and clear manner. Include key concepts, theories, methods and findings that are relevant to understanding and solving your topic.

Demonstrating general knowledge: This chapter is primarily intended to demonstrate that **you are familiar with the specialised literature** and that you are able to **find relevant data** that are key to solving your own research task.

Critical evaluation: It is not just a descriptive summary! You must **critically evaluate** the literature. *Example:* What are the strengths and weaknesses of existing approaches? Which problems remain unresolved? Where do you see room for improvement?

Contribution to the solution of the thesis: All the information provided should **contribute to the solution of your thesis**. Show how your thesis builds on previous research and what gaps it strives to fill.

2.2 Sources and citations

Primary literature: Focus on **primary chemistry literature**, i.e. primarily **articles from scientific journals** (e.g. *Journal of the American Chemical Society, Angewandte Chemie, Nature Chemistry, Chemical Communications* etc). These sources represent the most up-to-date and accurate knowledge.

Secondary sources (to a limited extent): Textbooks, monographs and review articles can serve as a starting point for understanding the broader context or for obtaining basic information, but for in-depth and up-to-date research, it is necessary to use primary sources.

Avoid general knowledge: It is not appropriate to quote generally known facts or to describe knowledge and data commonly given in textbooks (e.g. the definition of an atom, measurement techniques and basic rules of chemical nomenclature) unless they are directly and specifically relevant to your research.

Consistent use of citations: Any statement that is not your original finding or is not a generally known fact must be **properly supported by a citation** (e.g. [1], [1], [Brown, 2023], (1), (Brown, 2023)). Use citation managers for effectively managing citations. (see **Chap. 6**)

2.3 Structure and style

Connected text: The literature review should be written as a connected text, not as a list of annotated abstracts. Use logical transitions between paragraphs and topics.

Logical organisation: Divide the chapter into logical subchapters and sections that gradually develop the given topic, i.e. going from general to specific.

Objectivity: Write objectively and avoid personal opinions unless supported by clear evidence from the literature.

Language: Use grammatically correct, formal (academic) English and apply professional terminology accurately and consistently. Pay attention to spelling, punctuation and stylistic correctness – make sure there are **no typos and formal errors**.

Such mistakes can be easily detected and removed by automatic spell-checking tools, so it is advisable to submit the text to your consultant or supervisor only after it has been carefully checked.

Avoid sentences that are too long, cumbersome and complex that make the text difficult to understand. Instead, use concise clear and understandable formulations that allow the reader to easily follow the logic of the text and the author's flow of thought.

2.4 Difference between Introduction and Literature Review

Introduction: It briefly introduces the topic, defines the problem and objectives of the thesis. It serves to motivate the reader and provides basic context. It is shorter. (**Tab. 1.4)**

Literature Review: It provides a **detailed and critical overview** of the current state of knowledge, analyses methodological approaches and results of other authors relevant to the given problem. It is more extensive and detailed. Literature research directly related to the given topic and its critical evaluation.

3 EXPERIMENTAL SECTION

The chapter ‘Experimental Section is essential for the transparency and reproducibility of your work. It contains **a complete list and description of all materials, chemicals, software and analytical methods used**. Further, all experimental procedures, measurement conditions, description of instrumentation, data processing methods and possible artificial intelligence tools used are detailed here. This chapter also includes **a list of analysed samples**.

3.1 Structure and organisation

This chapter is usually divided into several subchapters for better organisation. Typical subchapters include:

3.1.1 Materials, chemicals and list of analysed samples

If this section is **required**, **consult** its scope and form **with your thesis supervisor**.

Include **only such scope of information that is necessary for the reproducibility of the experiments**. The text should correspond to the **publication standard** – i.e. it should give a brief, clear and factual description without unnecessary lists of equipment and common laboratory items.

This includes, in particular, **starting substances (analytical standards), reagents, solvents** and possibly **special equipment or materials** (e.g. cultivation devices, chromatographic columns, analytical devices etc) the type or manufacturer of which may affect the result of the work.

For each relevant chemical include the following:

- **name** (including the systematic or trade name, if applicable),
- **source** – i.e. **producer and country**,
- **purity** (e.g. p.a., HPLC, ≥ 99 %), if relevant.

For **common chemicals** (e.g. NaCl, KH_2PO_4, Tris, ethanol etc) a general description is enough, for instance:

‘Common chemicals for buffer and media preparation were obtained from Sigma-Aldrich, Merck and Lach-Ner in p.a. purity unless otherwise stated.’

Information about producer and purity **is not required for items** whose type **does not affect the result of the experiment**.

Unless otherwise stated, items can be sorted **alphabetically**. This is particularly suitable when the list contains a large number of items or when no other logical ordering is relevant (e.g. by function or use).

3.1.2 General procedures

Methodological approaches used (e.g. chromatographic separation, types of reaction apparatuses).

3.1.3 Instruments and analytical methods

Give an overview of the instruments, equipment and analytical methods used. Focus on those that affect the quality or reproducibility of the results.

For each instrument or method include:

- name and type of the instrument,
- manufacturer and country,
- possibly also key parameters of measurement or references to methods used (e.g. standard approaches, methodologies, literature).

Example: JEOL-ECZL400G 400 MHz NMR spectrometer (JEOL, Japan), Nicolet iS5 FT-IR spectrometer (Thermo Scientific, USA), Bruker microTOF-Q II mass spectrometer (Bruker Daltonik, Germany).

In case of more extensive measurements or multi-step analytical processes, provide a brief but sufficiently concise description of the procedure that will allow reproducibility of the results.

3.1.4 List of analysed samples

A list of analysed samples (e.g. biological samples, foodstuffs, fermentation products, synthesised compound etc) should be provided:

either **at the beginning of the Experimental Section** in a separate subchapter ‘Analysed Samples/Used Samples’,

or, if the list is too long, in the appendices, while a reference of the type ‘see Appendix X’ must be given in the text of the Experimental Section.

The choice depends on the type of work; the rule is that the reader must have **a complete overview of all used samples in one place**.

3.1.5 Providing information about Ethics Committee approval

If the performance of the work requires **approval by the Ethics Committee** (e.g. work with human subjects, animal models, sensitive biological materials or personal data), this information must be provided in the **Experimental Section**, ideally in the introductory sub-chapter of the type:

‘**Ethical approval’ or ‘Ethical aspects of research’.**

The text should include: name of the committee, meeting number or permit code (if assigned), date of approval,

Example: ‘The project was approved by the Ethics Committee XY under reference number EK-2025-001 on 12 March 2025.’

For more sensitive projects, it is advisable to add a sentence about compliance with the principles of the GDPR or work with personal data.

3.1.6 Synthesis/Preparation of compounds

Detailed descriptions of the preparation of individual compounds. The weighed amounts of substances and reagents are always given both in grams and moles, or millimoles.

Example: Formic acid (0.50 g; 10.9 mmol).

Note: **Think carefully** about the numbering of subsections, especially in this section; **here, less is more**. Do not list each partial experiment as a separate numbered subchapter. A short statement or one paragraph is not a chapter.

Description of methods and procedures

Accuracy and clarity: Descriptions of work procedures must be **precise, unambiguous and detailed enough** to allow other **researchers to reproduce the experiment**.

The text of the experimental section is written:

- **in past tense** as it describes experiments **conducted in the past**,
- **in the passive voice** in order to keep the text **neutral and objective**, focusing on the action, not on the author

Describe **all methods used so that they are reproducible**. If the **method is adopted, cite the source** and **clearly indicate any modifications**.

Example: for chromatography, indicate the type of column, mobile phase, gradient, flow rate, detector etc.

For syntheses, indicate reaction conditions, time, temperature, atmosphere etc.

Statistical methods, software, AI tools: Describe all software, statistical methods and artificial intelligence tools that you used for data collection, processing, analysis or visualisation.

Origin of results and citations

Origin of results: The student must **state the origin of all results** included in the final thesis.

Adopted procedures:

In case of the **preparation of a previously described substance according to the literature**, a detailed description of the entire experiment is not given.

Only a **citation of the reference** and possible differences/different parameters (e.g. cultivation time and temperature; type of medium; volume of the reaction mixture, achieved yield etc) are provided.

Further, **selected physical constants of the substance** (melting point, boiling point, optical rotation etc) measured as part of the final thesis and published in the literature **are compared**.

Example: The synthesis of compound **2** was carried out according to procedure [5], yield 85 %. MP: 120–122 °C (lit. [5] 121 °C).

The procedure is only given if the original procedure was modified in some way. Describe only the changes made. In case of adopted working procedures, a reference to the relevant literature is sufficient, or possibly a note on the changes made (e.g. different composition of the mobile phase).

Names of compounds: The full name of the compound (according to systematic nomenclature or at least clearly identifiable) is always given, supplemented by the compound number, if assigned.

Spectral and analytical data

Location of data:

Spectral data (NMR, MS, IR, UV-Vis) and elemental analyses can be summarised in a table for several substances (e.g. at the end of the Experimental Section).

Alternatively, they can be listed for individual compounds directly in the text of this section, following the description of their preparation.

Important rule: If these data serve to discuss the structure, mechanism or properties and are crucial for your conclusions, they are included in the 'RESULTS AND DISCUSSION' chapter. If the data only characterise the prepared substance and confirm its identity, they are included in the 'EXPERIMENTAL SECTION' chapter.

3.1.7 Dividing long chemical names and using hyphens

Long chemical names must be written using the correct hyphens to avoid errors, incorrect word division, or unintentional splitting of important parts of the name at line breaks. In scientific texts, this is essential for legibility and accuracy.

Types of hyphens used in chemical names

1) Nonbreaking hyphen

Insert: Ctrl + Shift + -

MS Word will not break the line there.

Used for:

- stereochemical and locational designation: (1*S*,2*R*)-, 2-, 3-, 4-
- prefixes: *N*-acetyl-, *O*-methyl-, *S*-benzyl-
- configuration of monosaccharides: α-D-, β-D-, L-, D-
- groups ending with -yl: 1*H*-1,2,3-triazol-1-yl

2) Optional hyphen

Insert: Ctrl + -

MS Word can break the line there, but the hyphen will **only appear at the break**.

Used for:

- long chemical names where it is appropriate to allow line breaks, e.g.: *Tri-O-acetyl, deoxy-3-[4-(3-fluorofenyl)…*
- multilevel substitutions in square brackets

How to insert hyphens into text

Use the **Find and Replace** function (Ctrl + H):

- Click **More >>**
- Button **Special**
    - Select: **Optional break** or **Nonbreaking hyphen**

Recommendation: Replace all common hyphens in a chemical name with one of these two types.

Example of a long name (schematically):

2,4,6-Tri-*O*-acetyl-3-deoxy-3-[4-(3-fluorfenyl)-1*H*-1,2,3-triazol-1-yl]-1-thio-β-D-galaktopyranose (9)

Example of a synthetic experiment description:

2,4,6-Tri-*O*-acetyl-3-deoxy-3-[4-(3-fluorfenyl)-1*H*-1,2,3-triazol-1-yl]-1-thio-β-D-galatopyranose (9)

Thioacetyl **8** (2,27 g, 4,45 mmol) was dissolved in dry THF (100 ml). The reaction mixture was then cooled to 10 °C and benzylamine (0.63 ml, 5.78 mmol) was added. The reaction mixture was stirred at 10 °C for 3 h. After all the starting material had been consumed, the reaction mixture was evaporated and the residue was dissolved in CH_2Cl_2 (150 ml) and extracted with H_2O (2 × 50 ml) and saturated aqueous solution of NaCl (50 ml). The organic phase was dried over $MgSO_4$, filtered and evaporated in vacuum. The crude product was purified by column chromatography on silica gel (3:1 cyklohexane/EtOAc). The product **9** (1.2 g, 58 %) was obtained in as a colourless oil.

R_f = 0.42 (1:1 cyclohexane/EtOAc). $[\alpha]_D^{20}$= +46.0 (c 0.3 in $CHCl_3$). **^{1}H NMR** (400 MHz, $CDCl_3$) δ 1,94 (s, 3H, C**H**$_3$CO-2), 2,05 (s, 3H, C**H**$_3$CO-6), 2,07 (s, 3H, C**H**$_3$CO-4), 2.46 (d, $J_{SH,1}$ = 9,9 Hz, 1H, S**H**), 4.08 – 4.19 (m, 3H, H-5, H-6), 4.72 (t, $J_{1,2}$ = $J_{1,SH}$ = 9.7 Hz, 1H, H-1), 5.16 (dd, $J_{3,2}$ = 11.1, $J_{3,4}$ = 3.3 Hz, 1H, H-3), 5,62 (dd, $J_{4,3}$ = 3.3, $J_{4,5}$ = 0.7 Hz, 1H, H-4), 5.69 (dd, $J_{2,3}$ = 11.1, $J_{2,1}$ = 9.3 Hz, 1H), 7.03 (tdd, J = 8.4, 2.7, 1.0 Hz, 1H, H-4-C_6H_4F), 7.34 – 7.42 (m, 1H, H-5-C_6H_4F), 7.48 – 7.56 (m, 2H, H-2-C_6H_4F, H-6-C_6H_4F), 7.81 (s, 1H, H-5-triazol). **^{13}C NMR** (101 MHz, $CDCl_3$) δ 20.54 – 20.81 (3x **C**H_3CO), 61.63 (C-6), 63.11 (C-3), 68.88 (C-4), 69.90 (C-2), 76.10 (C-5), 80.13 (C-1), 112.86 (d, $J_{C,F}$ = 23,1 Hz, C-2-C_6H_4F), 115.48 (d, $J_{C,F}$ = 21.3 Hz, C-4-C_6H_4F), 118.79 (C-5-triazol), 121.46 (d, $J_{C,F}$ = 3.3 Hz, C-6-C_6H_4F), 130.69 (d, $J_{C,F}$ = 8.4 Hz, C-5-C_6H_4F), 132.28 (d, $J_{C,F}$ = 8.4 Hz, C-1-C_6H_4F), 147.02 (d, $J_{C,F}$ = 2.9 Hz, C-4-triazol), 163.32 (d, $J_{C,F}$ = 246.1 Hz, C-3-C_6H_4F), 168.87 (CH_3**C**O-4), 170.06 (CH_3**C**O-2), 170.53 (CH_3**C**O-6). **^{19}F NMR** (376 MHz, $CDCl_3$) δ -112.35 (td, J = 9.0, 6.0 Hz, C_6H_4**F**). **FT-IR** 3139, 2964, 2571, 1748, 1620, 1589, 1558, 1487, 1458, 1372, 1219, 1073, 1050, 865, 787, 721, 686, 598 cm^{-1}. **HRMS** (ESI) m/z pro $C_{20}H_{22}O_7FN_3SNa^+$ $[M+Na]^+$ calcd 490.1055, found 490.1051.

3.1.8 Using artificial intelligence tools (AI)

If artificial intelligence was used in the preparation of the thesis, this fact must be **clearly and transparently stated in the Experimental Section**. The student will briefly specify:

- **which tools** were used,
- **scope of use** (e.g. idea generation, language proofreading, visualisations, scripting, data preprocessing),
- **for what purpose** (e.g. making literature search more efficient, code structure design, test analyses).

Responsibility of the author: It should be noted here that all texts and non-textual materials created by artificial intelligence tools can only be used as the basis for further work, not as results. AI outputs must always be verified! The author of the work is fully and exclusively responsible for their use.

4 RESULTS AND DISCUSSION

The ‘Results and Discussion’ chapter is the **most important and largest part** of your final thesis. Its aim is to present your own findings, interpret them and place them within the context of previously published findings. In this chapter you will demonstrate your analytical skills, knowledge of the topic in question and ability to draw valid conclusions.

4.1.1 Presentation of results

Completeness and good organisation: Present the **complete results** of your work. Use a combination of text, tables, graphs, figures and schemes to present them. Each visual element must be accompanied by a **verbal commentary** that explains what is shown and what the key findings are.

Consistency of data presentation: **Measured data should generally be presented just once.** If the results are presented in the form of a graph, it is not necessary to present them again in a table and vice versa. Choose the most appropriate form of presentation that clearly and effectively conveys the information.

Spectra and chromatograms: Entire **spectra and chromatograms are generally not included** in the text (or in an appendix) as figures unless they are **absolutely necessary** for a specific discussion (e.g., to determine the configuration, unusual impurities, or if a specific, unusual property is discussed using them). Key data (chemical shifts, binding constants, wavenumbers, *m/z* values, etc.) are given as text or table, as we have already explained above in the sections on NMR, IR, MS, UV-Vis and elemental analysis.

4.1.2 Discussion of results

Critical evaluation: Your own results must be **discussed critically** in the light of previously published findings in the field. Compare your findings with the information in the literature. Do your results confirm what was expected, or are they different? Why?

Analysis and comparison: Discussion is where the author demonstrates their **knowledge of the topic**. You must display your ability to sort and compare data, analyse trends, correlations and deviations.

Drawing conclusions: You must draw **valid and correct conclusions** from the Discussion. What are the implications of your findings? What do they mean for the given field of research or practical applications? Formulate your conclusions clearly and based on evidence.

Answers to the thesis objectives: Make sure that the Discussion clearly answers the **objectives and questions** that you set out in the Introduction.

4.1.3 Citations in Discussion

Importance of citations: Do not forget to **provide consistent citations** in this section. You did not invent a large part of the reactions, methods, principles and comparative data used; you adopted them from the literature. Any statement that is not your original result or a generally known fact must be supported by a proper citation.

Application character: Even if you 'used', not 'invented' a method, it is necessary to state where you drew inspiration for its application from, or with which results in the literature you compare your results.

4.1.4 Chapter structure

Separate chapters: The results of the work and their discussion **may be presented in separate chapters** (e.g. '4 Results' and '5 Discussion') according to the recommendations of your supervisor and department (see **tab. 1.3**). This division may be useful for very long theses with a large number of results.

One chapter: However, for most theses, **one chapter 'RESULTS AND DISCUSSION'** is enough, in which the results are interpreted and confronted immediately after their presentation. This arrangement often leads to a smoother text and a better connection of the results with their significance.

Summary: The 'Results and Discussion' chapter is your opportunity to demonstrate that you are able not only to conduct experiments, but also to meaningfully interpret, critically evaluate and place them within a broader scientific context. Here, consistency in formatting, careful citing and depth of analysis are key.

5 CONCLUSION

The ‘CONLUSION’ chapter is the final summarisation of your thesis and its impacts. It is not a recapitulation, but a space where you can emphasise the originality and importance of your findings.

5.1.1 Purpose and main content

Summary of major results: First, briefly and concisely **summarise the most important results** you have reached. Focus on the key findings, not on the detailed data that has already been described in the ‘Results and Discussion’ chapter.

Overview of entire thesis: Give a **comprehensive overview of the entire thesis** in terms of the results achieved. Do not repeat the Introduction, but show how your work has developed from the stated objectives to the findings achieved.

Emphasising originality and contribution: The key here is to **emphasise what is new in your thesis**. What are the original findings? How does your thesis advance the existing knowledge in the given area? What is its scientific or practical impact?

Recommendations for further research: Based on your findings and critical evaluation, formulate recommendations for future research in the given area. What should be investigated further? What problems remain unresolved and how could they be approached?

5.1.2 Scope and style

Scope: Conclusion **should not be longer than two pages**. Be brief and concise.

Form: It should be **concise, clear and understandable**. Use clear and concise language, avoid unnecessary repetition. It can be written as a connected single text or in bullet points.

Final results and findings: The Conclusion should show the reader **what concrete results the author of the thesis has reached** and **what new and beneficial knowledge about the topic they have achieved**.

Achievement of objectives: The author must **emphasise the extent to which the set objectives were met or were not met**, and **why this is the case**. An honest assessment of unmet objectives (with an explanation of the reasons) is a sign of academic maturity.

5.1.3 What to avoid

Do not copy the Summary: The Conclusion **must not copy the Summary/Abstract** of the thesis. While the Summary is a very short overview for quick orientation (often with an emphasis on methods and results), the Conclusion is more detailed, analytical and focused on discussing the contribution and future directions.

Not just repetition: The Conclusion **must not be a mere repetition of the results achieved** as described in the 'Results and Discussion' chapter. Instead of listing again the numbers and data, focus on their meaning and implications.

New information: The Conclusion **should not include completely new results** or methodological procedures that were not described in previous chapters.

6 REFERENCES

The ‘REFERENCES’ section (sometimes also called the ‘Referencelist’) is a **numerically or alphabetically ordered complete list of all information sources** that you have cited in your thesis. Its accuracy and consistency with the references in the text of the thesis are absolutely crucial for the academic integrity of your thesis.

6.1 Basic principles

Completeness and consistency: The reference list must be **complete** and **fully consistent with the references actually used in the text of the thesis**. This means that each reference (number in parentheses or other style) in the text must have its counterpart in the reference list and vice versa.

Formatting: The manner in which individual references are written is governed by the chosen citation style. Consistency in formatting is key!

6.1.1 Using reference management software

It is highly probable that the reference list is **generated by reference management software** (such as **EndNote**, **Mendeley** etc). Using these tools is **highly recommended** as it minimises formatting errors and ensures consistency.

Advantages: Reference managers automatically format citations and references according to the chosen citation style and make their management easier.

Review: Even when using a manager, it is necessary to **carefully review** the resulting list.

In particular, check the following:

- Accuracy and completeness of all data (names of authors, titles, volumes, ISO journal abbreviations, pages, DOI).
- Consistency of formatting (e.g. punctuation, italics, bold).
- Compliance with references in the text.

ISO journal abbreviations

Abbreviations of journal titles according to ISO 4 (International Organization for Standardization) represent a standardised way of abbreviating the titles of scientific journals that is used, for example, by ACS, RSC, Elsevier, Wiley and other publishers.

These abbreviations are listed primarily in the bibliography and ensure consistency of citations across publications.

Basic rules for creating ISO journal abbreviations

- Only words are abbreviated, not proper names (e.g. *Nature, Science* are not abbreviated).
- Each abbreviated word ends with a full stop.
- Conjunctions, prepositions, articles (e.g. *of, and, the*) are omitted.
- **Capital letters** are used for all content words (e.g. *J. Med. Chem.*, not *j. med. chem.*).

Here you can find a list of ISO abbreviations of journals.

6.2 In-text citations and references

6.2.1 In-text citations

There are two main recommended citation styles for in-text citations and the reference list. You always have to **choose one of them and follow it consistently throughout the thesis**. In addition, before you start writing your thesis, always **agree with your thesis supervisor** which style they prefer.

ACS style (Numerical style)

Numbering: Sources are numbered with **Arabic numerals** in the exact order in which they first appear in the text. This includes references in the main text, tables and diagrams.

In-text citations format: It is better to give the references as a numbers in square brackets (e.g. text**[1]** or text**[1]**).

ACS uses a **numerical citation system**, where in-text citations correspond to the order in the reference list. It is recommended that numerical citations be written **after a full stop or comma**, i.e. **after the end of a sentence or idea**, not *in the middle of* a sentence. The reason for this is that a **numerical reference** (unlike for the author–year system) **is not a grammatical part of the sentence**, but refers to the source as a whole – like a footnote.

Text.[1] or Text.[1]

Example: Glucose is one of the most common carbohydrates in nature.[1] The reaction was carried out under reflux for 2 h.[12, 13]

Numerical order: The sources in the list are **ordered numerically** in the order in which they first appear in the text of the thesis. The first cited source in the text will have the number [1] or [1], the second will have [2] or [2] etc.

Why parentheses? The use of square brackets (parentheses) helps to **avoid problems with distinguishing** between the exponentiation operation (e.g. m^2). In this case, it is better to use (e.g. m (lit. 2)).

Reference list: The sources in the reference list are then ordered numerically.

Harvard style (Author-year of publication)

In-text citations: The citation is given in the format (**last name of the author, year of publication**), e.g. (Brown, 2023) or (Norton et al., 2024).

Location of in-text citation: The in-text citation is part of the sentence. If it is placed at the end of a sentence, the **full stop at the end the sentence is written after the citation** (e.g. …it was proven (Brown, 2023).).

Reference list: References in the reference list are arranged **alphabetically by the last name of the first author**. If you refer to multiple works by the same author, they are further arranged chronologically by year of publication.

6.3 Abbreviations of journal titles

Consistency is essential when listing journal titles in the reference list.

Uniformity is key: List **all** journal titles in your references either **using standardised abbreviations** or **full titles**. **Do not combine** the two styles.

Checking the correctness of the abbreviations: When checking the correctness, always use trustworthy sources:

- **CASSI** (Chemical Abstracts Service Source Index):
  Available online at http://cassi.cas.org.
  You can also use Journal Citation Reports™.

- You will find the relevant chapter also in Baysinger B., Pienta K. ACS Style Quick Guide to Scholarly Communication, DOI: https://doi.org/10.1021/acsguide
- **A list of abbreviations for *Collection of Czechoslovak Chemical Communications*** (kindly provided by Dr. Valter). The list for download and how to import to EndNote can be found at https://www.chemtk.cz/cs/82942-endnote.
- **Instructions from the UCT Prague Publishing House:** Use the citation generator provided by UCT Prague or follow the detailed instructions for ACS or ISO formatting (available in Czech).
- **The 'References' chapter in ACS Style Guide:** For more detailed information, see Chapter 4.3 References, Baysinger B., Pienta K. ACS Style Quick Guide to Scholarly Communication, DOI: https://doi.org/10.1021/acsguide.

6.3.1 Important notes on the reference list

Do not combine references under one number: Do not use the format 1a, 1b etc in the reference list. Each reference must have its own unique number.

If you are using EndNote with ACS style, make sure you have disabled the option 'Edit / Output Styles / Edit Style / Citations / Numbering / Use one number for references cited together' (see Fig. 6.1 in your instructions).

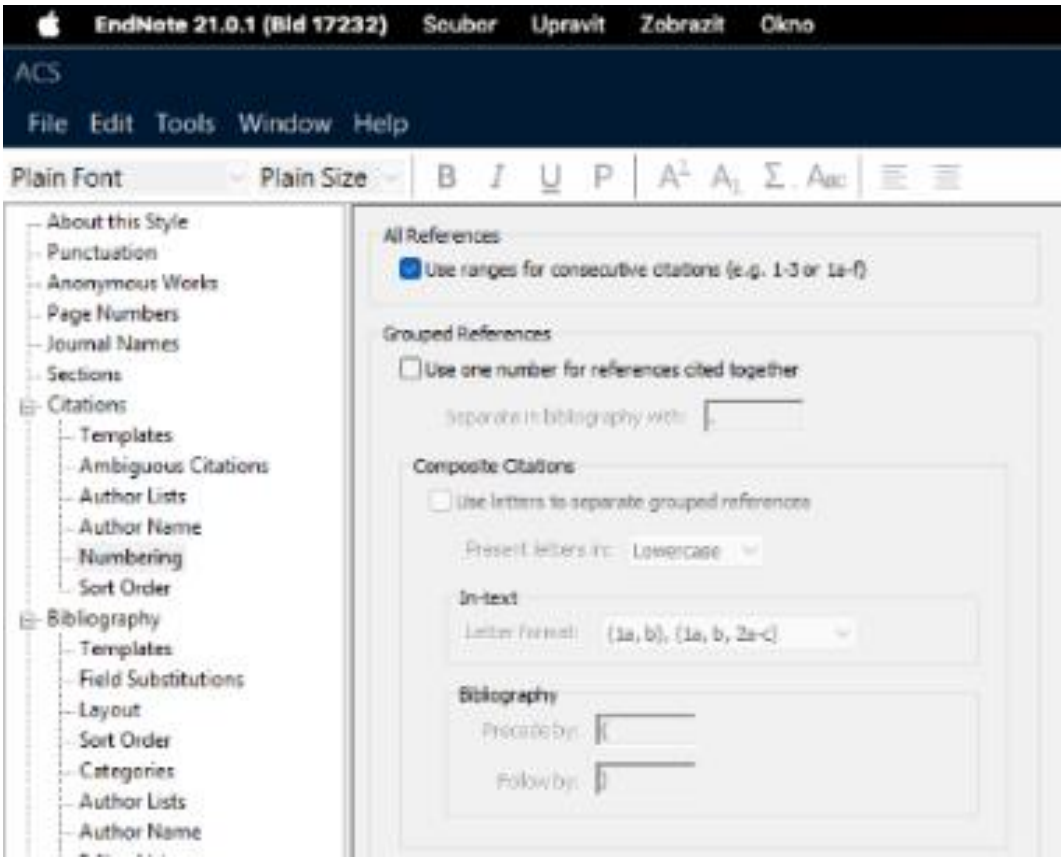

Figure 6.1: Disabling grouped references in EndNote for ACS style.

The author is always responsible: Even if you use a reference manager, **it is always your responsibility to review the generated references for accuracy**. Carefully check the up-to-dateness of the style used, the correct spelling of journal abbreviations, names of authors and all other bibliographic information.

By following these guidelines, you will ensure that your citations and references are error-free, consistent and fully compliant with academic standards.

6.4 How to write references

You can find concrete examples here '[ACS Style Quick Guide 4.3]'

- **Article with numbers of pages**

[Author 1]; [Author 2]; ...; [Last author]. [Article title]. [*Daily title*] [**Year**], [*Volume*] ([Issue]), [Pages] ([An explanatory note if necessary])]. [DOI or URL]

- **Article with number of article**

[Author 1]; [Author 2]; ...; [Last author]. [Article title]. [*Daily title*] [**Year**], [*Volume year*] ([Issue]), [Article number] ([An explanatory note if necessary]). [DOI or URL]

- **Preprint**

[Author 1]; [Author 2]; ...; [Last author] [Preprint title], ver. [Version number]. [*Preprint Server*], [Date]. [DOI or URL]

- **Journal with number of volume years and issues**

[Author 1]; [Author 2]; ...; [Last author]. [Article title]. [*Journal title*] [**Year**], [*volume year*] ([Issue]), [pages]. [DOI or URL]

- **Journal without number of volume years and issues**

[Author 1]; [Author 2]; ...; [Last author]. [Article title]. [*Journal title*] [Date], [Pages]. [DOI or URL]

- **Online newspapers**

[Author 1]; [Author 2]; ...; [Last author]. [Article title]. [*Newspaper title*] ([Place of publication, if necessary]), [Date], [Date of update (if necessary)]. [DOI or URL]

- **Books with authors**

[Author 1]; [Author 2]; ...; [Last author]. [*Book title*], [number] ed.; [Publisher]: [Place of publication], [Year]. [DOI or URL]

[Author 1]; [Author 2]; ...; [Last author]. [Chapter title]. [*Book title*], [number] ed.; [Publisher]: [Place of publication], [Year]. [Pages]. [DOI or URL]

[Author 1]; [Author 2]; ...; [Last author]. [*Book title*]; [translator], [translator 2], ..., [last translator], translation; [Publisher]: [Place of publication], [Year]. [DOI or URL]

- **Chapter in a book with editors**

[Author 1]; [Author 2]; ...; [Last author]. [Chapter title]. [*Book title*], [Number] ed.; [editor 1], [editor 2], ..., [last editor], eds.; [Publisher]: [Place of publication], [Year]. [Pages]. [DOI or URL]

- **Whole book with editors**

[*Book title*], [Number] ed.; [editor 1], [editor 2], ..., [last editor], eds.; [Publisher]: [Place of publication], [Year]. [DOI or URL]

- **Article in a continuously updated book with edition number and version number**

[Author 1]; [Author 2]; ...; [Last author]; et al. [Article title]. [*Book title*], [Number] ed. [or] Ver. [Version number]; [editor 1], [editor 2], ..., [last editor], eds.; [Information about book series or set]; [Publisher]: [Place of publication], [Date of publication online]; [Pages, if available]. [DOI or URL]

Important note: Place of publication should be included only in case of small or specialised publishers.

- **Website**

[Author 1]; [Author 2]; ...; [Last author]. [*Website title*]. [DOI or URL]

- **Website, record or blog post**

[Author 1]; [Author 2]; ...; [Last author]. [Website, record or blog post title]. [*Website/blog title*]. [Organisation (if it exists)], [Date]. [DOI or URL]

- **Online documents or files**

[Author 1]; [Author 2]; ...; [Last author]. [*Document title*]; [name of website or organisation], [Date]. [DOI or URL]

- **Content from an online database**

[Author 1]; [Author 2]; ...; [Last author]. [Title of item in database]. [*Database title*]; [Organisation (if it exists)], [Date]. [DOI or URL]

- **Audio or video**

[Author 1]; [Author 2]; ...; [Last author]. [*Audio or video title*]. [Organisation/Production company]. [Website/Platform], [Date]. [DOI or URL]

- **Audio or video as part of a series**

[Author 1]; [Author 2]; ...; [Last author]. [Audio or video episode title]. [*Programme or series title*]. [Organisation/Production company]. [Website/Platform], [Date]. [DOI or URL]

- **Podcast**

[Author 1]; [Author 2]; ...; [Last author]. [Episode title]. [Podcast title]. *Programme or series title]*. [Organisation/Production company]. [Website/Platform], [Date]. [DOI or URL (if available)]

- **Conference paper/presentation published as a chapter in a book for conference proceedings:**

[Author 1]; [Author 2]; ...; [Last author]. [Article/presentation title]. [*Collection work title*], proceedings [name of meeting], [place of meeting], [date of meeting]; [editor 1], [editor 2], ..., [last editor], eds. [if provided]; [Publisher], [Year]; [Pages], [Abstract/Paper number]. [DOI or URL]

- **Conference paper/presentation published as an article in a journal for conference proceedings:**

[Author 1]; [Author 2]; ...; [Last author]. [Article/presentation title]. [*Daily title*] [**Year**], [*Volume*] ([Issue]), [Pages or article number] ([a note on the meeting or conference, if necessary]). [DOI or URL]

- **Abstract from a conference or preprint published as a book**

[Author 1]; [Author 2]; ...; [Last author]. [Abstract title]. [*Collection work title*], *proceedings [name of meeting],* [place of meeting], [date of meeting]; [editor 1], [editor 2], ..., [last editor], eds. [if provided]; [Publisher], [Year]; [Pages], [Abstract/preprint number]. [DOI or URL]

- **Abstract from a conference or preprint published as a journal**

[Author 1]; [Author 2]; ...; [Last author]. [Article/presentation title]. [*Daily title*] [**Year**], [*volume year*] ([Issue]), [Abstract/preprint number] ([a note on the meeting or conference, if necessary]). [DOI or URL]

- **Presentation at a conference**

[Author 1]; [Author 2]; ...; [Last author]. [*Presentation title*]. Presented at [name of conference], [place], [date/s]. [Website/depository/name of platform], [Date (if different than the date of the event)]. [DOI or URL]

- **Conference poster**

[Author 1]; [Author 2]; ...; [Last author]. [*Poster title*]. Presented at [name of conference], [place], [date/s]. [Website/depository/name of platform], [Date (if different than the date of the event)]. [DOI or URL]

- **Panel discussion or symposium**

[Author 1]; [Author 2]; ...; [Last author]. [*Name of panel discussion/symposium*]. Presented at [name of conference], [place], [date/s]. [Website/depository/name of platform], [Date (if different than the date of the event)]. [DOI or URL]

- **Datasets created/compiled by authors**

Author 1; Author 2; ...; Author 10; et al. [*Title*], Ver. [Version number] (Dataset). [Publisher/Organisation/Platform], [Date] ([A note, if necessary]). [DOI or URL]

- **Datasets created/compiled by organisations**

[*title*], ver. [version number] (dataset). [Publisher/Organisation/Platform], [Date] ([A note, if necessary]). [DOI or URL]

- **Published patent**

[Inventor 1]; [Inventor 2]; ...; [Last inventor]. [Patent title]. [CC12345678KC], [Year of publication].

- **Patent application**

[Inventor 1]; [Inventor 2]; ...; [Last inventor]. [Patent application title]. [CC12345678KC], [Year of publication].

Note: CC = country code, 12345678 = patent number and KC = kind code

- **Safety data sheet from manufacturer**

[*Title*] ([CAS registration number]). [Product stock or catalogue number], [Number of revision (rev.) or version (ver.). [Manufacturer]: [Location], [Date]. [URL]

- **Individual post on social media**

[Author] ([Username if available]). [Whole text on social media or beginning of the text on social media]. [*Social media platform/Social media name*], [Date of publication]. [URL (if available)]

- **Group of posts on social media or conversations on the given topic**

[Name or description of the post/conversation]. [*Social media platform/Social media name*], [Date of publication]. [URL (if available)]

- **Software or program code accessible from a repository or platform**

[Author 1]; [Author 2]; …; [Last author]. [*Title of software code or program*], ver. [version number]. [Depository/Platform], [Year]. [DOI or URL]

- **Software or program code accessible from a publisher**

[Author 1]; [Author 2]; …; [Last author]. [*Title of software code or program]*, ver. [version number]. [Publisher]: [Location of publisher], [Year]. [DOI or URL]

- **Recommended format for citing a standard is as follows**

[*Standard title*]. [Standard number]. [Organisation for standards], [Year]. [DOI or URL]

- **Recommended format for citing technical reports and bulletins is as follows**

[Author 1]; [Author 2]; …; [Last author]. [*Report or bulletin title*]; [number of report or bulletin]; [Publisher]: [Place of publication (if necessary)], [Date]. [DOI or URL]

- **Recommended format for citing final theses is as follows**

[Author]. [Dissertation/diploma thesis title]. [Type of final thesis], [Institution awarding the degree], [Place (if necessary)], [Year]. [DOI or URL]

- **Wikipedia article**

[Article title]. [*Wikipedia*]. [URL] (accessed on [RRRR-MM-DD])

- **Artificial intelligence (AI)**

Chatbot	*ChatGPT-4o* (AI Chatbot). OpenAI. https://chatgpt.com/ (accessed on 2024-08-28)

	Gemini (AI Chatbot). Google. https://gemini.google.com/app (accessed on 2024-08-28)
Image generator	*Copilot Designer* (AI Image Generator). Microsoft. https://copilot.microsoft.com/ (accessed on 2024-08-28)

7 LIST OF ABBREVIATIONS

A mandatory part of the final thesis. It contains an alphabetical list of abbreviations used. It does not include the symbols of quantities and units defined in the SI system (they belong in the chapter ‘List of symbols’).

Here you will find an example of a **list of the most common abbreviations, acronyms and symbols** used in the English language. This list can help you when writing the final thesis.

Use the ‘List of symbols’ style; separate the abbreviation and the explanation with a tab.

Example:

MD molecular dynamics

PET positron emission tomography

PP polypropylene

PU polyurethane

An abbreviation is not a formula.

In a chemistry paper, it is necessary to distinguish between an abbreviation and a chemical formula, because they are two different types of notation.

A chemical formula (e.g. NaCl, TMSCl, EtOH) refers to the composition of a substance – that is, what elements and in what ratio the given compound contains.

An abbreviation (e.g. TMS, Et, Boc, Ac, DMF) represents a simplified text symbol for a longer chemical name or group that is commonly used in organic chemistry to make notations easier.

Example:

NaCl is not an abbreviation but a formula

TMSCl is not an abbreviation but a formula (in this case, only TMS is an abbreviation)

TMS trimethylsilyl

t

8 LIST OF SYMBOLS

An optional but recommended part of the final thesis. Provide a list of symbols used, ideally with their units and/or physical dimensions. Symbols should be grouped alphabetically, the order of the groups is as follows:

- lowercase Latin letters,
- uppercase Latin letters,
- Greek symbols,
- other symbols.

Use the ‘List of symbols’ style.

Example:

c concentration, mol m^{-3}

c_p specific heat capacity of gas, J K^{-1} kg^{-1}

k_c mass transfer coefficient, m s^{-1}

D diffusion coefficient, m^2 s^{-1}

α heat transfer coefficient to the surroundings, J m^{-2} K s^{-1}

9 LIST OF FIGURES

An optional part of the final thesis. It is recommended for longer theses (dissertations/diploma theses). If you used the (MS Word) ‘Insert caption’ feature, you can easily insert a list of images: References/Insert list of images/Choose the label ‘Image’/OK.

10 APPENDICES

It contains, for example, registration records, schemes, sample chromatograms or spectra etc, if the type of the final thesis requires it.

If it is necessary to further divide the appendices, mark them with the letters A, B, C and so on.

For appendices larger than A4 (e.g. large-format photographs), consult the printing office.