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Institute of Organic Chemistry

**Guidelines for the *Organic Chemistry Lab Course C* in the *Organic Synthetic Methods* (OCC) module of the AFB 2019 and 2025**

**1. Eligibility requirements and objectives**

According to the current model study plan for the Bachelor's degree in Chemistry, the advanced organic chemistry lab course is taken in the 6th semester. The course of the internship will be explained in a preliminary discussion, to which invitations will be sent via STUD.IP.

It would be desirable to complete the modules Organic Experimental Chemistry 1 (OCA) and Synthesis Practice (OCB) in order to ensure a successful OCC internship. The aim of the organic chemistry internship C is to introduce students to modern synthetic work in ongoing research projects. On the one hand, the basic knowledge of organic-chemical laboratory practice is to be deepened. On the other hand, it is to be expanded through additional experiences, such as working under oxygen- and water-free conditions, as well as knowledge of chromatographic separation. In addition, you will be introduced to the spectroscopic evaluation of your preparations and thus gain insight into organic-chemical analysis methods.

**2. Organization and prerequisites**

The practical course can be started at any time and must be completed in a maximum of **three months**. However, please register via STUD.IP before the start of the semester in which you want to complete the practical course. Before you can start the preparative work, two prerequisites must be met.

1. Participation in a safety seminar with Prof. Schmidt. There are two dates for this participation, one at the beginning and one at the end of the lecture period. The exact dates can be found on the STUD.IP. Participation is mandatory and must be confirmed by you with a signature. The internship cannot begin without the safety seminar.

2. After the safety seminar, please hand in a safety exam (α, β or γ) correctly completed to Bolin Zhu in room 210 A. The safety exam must be handed in at least two weeks and at the latest one week before the start of the preparative work.

The safety exams can be found on the institute's homepage at the following link <http://www.ioc.tu-clausthal.de/studium/praktikum/>.

If points 1 and 2 are fulfilled, the internship can begin. On the first day of the preparative work, registration with Bolin Zhu in room 210 A takes place by filling out a docket.

**3. Procedure**

Three months are available from the start of the preparative work to complete the internship. If this period is exceeded without a relevant reason under examination law, the internship will not be recognized and must be repeated. In the event of illness, please always submit a medical certificate to Bolin Zhu in room 210 A.

During the internship, eight preparations and one microanalysis will be processed. Four of these preparations will be processed by one assistant. The two assistants should each work in one of the two research groups at the IOC (Schmidt, Wilhelm) in order to provide you with a good insight into the research at the institute. The microanalysis will be carried out by one of the two assistants.

Bolin Zhu is the point of contact for assigning the assistants.

**4. Protocols**

Protocols must be prepared for each of the eight specimens and for the microanalysis. The protocols must be submitted to the responsible assistant at the institute no later than two weeks after completion of the respective specimen (completion of the experiment and availability of all analytical data). If this deadline is exceeded, the stage will not be count and must be repeated. If a second correction is required, this must also be submitted within two weeks. The protocols must be written independently, i.e. they must consist of independently written texts and self-drawn molecular structures. The ChemBioOffice Ultra program should be used to display the molecular structures and reaction mechanisms. This program can be downloaded free of charge from the computer center website (RZ).

A complete protocol contains the following items. An example protocol can be found on the institute's homepage at the following link.

<http://www.ioc.tu-> [clausthal.de/studium/praktikum/](http://www.ioc.tu-clausthal.de/studium/praktikum/).

Name of the compound in correct IUPAC nomenclature (see the IUPAC guidelines, OC library, A18)

Reference of the working instructions

For literature levels, the complete citations must be given here, i.e. the names of all authors, e.g.: A. Ixmann, B. Ypsilonsen and C. Zettinger, and the journal citation in the correctly abbreviated form with, if applicable, volume, year, volume, page number, e.g.: *Chem. Ber*. **1985**, *118*, 3966. For unpublished original instructions (“in-house instructions”), the assistant from whom they originate, his working group and the year are given.

Present reaction equations and mechanism. For the reaction equations, state the molecular weight of the educts and the product under the formula.

· Description of the actual procedure – in the past tense – with details of the quantities of reagents in g or mL **and** (m)mol.

· Characterization of the product according to the assistant's requirements (e.g. melting point, boiling point, refractive index, rotation value, RF value, spectroscopic data, etc.) and, for comparison, the corresponding data from the literature.

The obtained yields in grams and percent of the theory (not the literature) with the comparative value from the literature.

Certified protocols are to be sent to the assistant as a PDF file.

If a protocol is clearly recognizable as plagiarism, the experiment will not be count. For the uncount experiment, a penalty preparation must be carried out in the same working group by another assistant. The protocol for the penalty preparation must then be submitted in handwritten form.

**5. Completion of the internship**

At the end of the internship, please contact Bolin Zhu in room 210 A with all certified protocols to complete your certificate. The internship is not complete until all preparations and the microanalysis have been entered on this certificate.

**6. Completion of the module**

The module Organic Synthetic Methods OCC is only completed when the 45-minute oral exam “Reaction Mechanisms and Reactive Intermediates” has been successfully passed and the seminar on “Organic Chemistry” has been successfully attended.