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Translation of Curriculum Statement for Graduate Level (Third-level) Education

Chemistry with specialization in Inorganic Chemistry

Swedish title: Kemi med inriktning mot oorganisk kemi

TNKEMI06

Swedish Curriculum adopted by the Board of the Faculty of Science and Technology (Board for Third-level Education) on 2012-01-23
Translation approved 2012-01-23.

The Curriculum Statement for Third-level Education consists of three parts: a general part, this subject specialized curriculum statement, and each doctoral student's individual study plan.

Objective

Based on the basic training within the scientific discipline, the education on the graduate level shall result in a high level of knowledge within at least one sub-area of the discipline. Through supervision and writing of the thesis the doctoral student shall be prepared for a scientifically independent and critical professional role within areas in which a high level of scientific knowledge and research abilities are essential.

The doctoral student shall also be able to present her/his own goals and results orally and in writing to different target groups in English and, in the case of Swedish-speaking doctoral students, in Swedish.

Subject description

Inorganic chemistry focuses on the chemical compositions of inorganic compounds as well as their structures, reactivities and properties. Inorganic chemistry is a vast research area with a large number of applications including products within Swedish industry and the environmental sector. Examples of applications include: electronics, cutting tools, steel, hard metal, solar cells, batteries, fuel cells, catalysts, corrosion protection and sensors.



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Eligibility

Basic Eligibility

The basic eligibility for third level education is described in the general part of the curriculum statement.

Special Eligibility

A person has special eligibility for a third level program in inorganic chemistry if she/he has passed examinations in courses of chemistry or in courses of areas of relevance for the discipline, ranging a minimum of 90 higher education credits (of which at least 60 higher education credits should be on the advanced level and at least 30 higher education credits within chemistry), or if she/he has acquired the equivalent knowledge abroad. More information regarding the special eligibility can be provided by the professor responsible for the third-level education.

Examples of educations providing special eligibility are the one and two year master programmes in Chemistry, both including a minimum of 40 higher education credits within inorganic chemistry at the advanced level (prior to 2007: CD-level), and the material chemistry branch of the Chemical Engineering Programme, with at least 90 higher education credits within this branch.

To be accepted as a doctoral student in inorganic chemistry it is required that the candidate is judged to have the ability required to conclude the graduate level education. The decision based on this evaluation of the ability is made by the head of the department in collaboration with the professor in charge of the graduate level education, the professors responsible for the research programmes and the supervisors within the discipline.

Admission

Applicants for third level program in inorganic chemistry must submit an application to the head of the Department of Chemistry, The Ångström Laboratory. Admissions to places in third level programs take place normally several times per year.

In connection with the admission it must be stated how it is planned to finance both the personal maintenance of the doctoral student, and her/his research.



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Program structure

In connection with the admission, each doctoral student and her/his supervisor shall draw up an individual study plan after consultation with the professor in charge of the third level program. The plan is to be approved by the head of the department (by delegation of the Faculty Board), in connection with the admission.

The individual study plan shall be reviewed jointly by the doctoral student and her/his supervisor, annually, and be provided with a summary of the achieved results and the plans for the coming year. Significant changes and any disagreement on the individual study plan shall be reported to the head of the department or, if deemed necessary, to the Board for Third-level Education.

Courses

Within the third level program there may be different kinds of courses, such as lectures, literature studies, practical training, field studies, etc. The courses are intended to provide wider insights into the subject as a complement to the specialist competence acquired in the research work.

Both for the doctoral degree and the licentiate degree the following courses are compulsory: Inorganic chemistry (10 higher education credits) and Inorganic structural chemistry (5 higher education credits). A course in research ethics should also be included. Pedagogical training is likewise compulsory for doctoral students that teach on the fundamental or advanced level.

An introduction course to studies at the doctoral level and a course in scientific writing are recommended.

The selection of the remaining courses is made together with the supervisors based on the specific research topic and if the doctoral student is participating in a compulsory graduate school or not. These courses are selected in connection with the establishment of the individual study plan. Example of courses include: structural investigations using X-ray diffraction, chemical bonds, molecular spectroscopy, electrochemical methods, electrochemical materials, energy relevant materials, theoretical materials modeling, solid state physics, surface physics, electronics, electron microscopy, super conduction, condensed materials theory, symmetry and vacuum



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technology. Other courses given at other universities may also be included.

For the doctoral degree, a minimum of 25 higher education credits is required within the field of chemistry.

The range of courses and the content of the literature courses are continuously revised. The graduate student may also be registered within a research school, with compulsory as well as elective courses given in Sweden or abroad.

The graduate courses are normally taken in the first part of the third-level education.

The course frequency depends on the availability of the required resources. The graduate student is expected to study parts of the course literature by himself. Such independent study activities are important elements within the third-level education.

Exams for the third-level education courses may be given as written or oral exams and are arranged according to agreements between the graduate student and the main supervisor or the course responsible individual. The exams are marked using one of the grades: passed or failed.

The graduate student is expected to participate in the scientific activities at the department by e.g. taking active part in seminars and by attending invited lectures.

Requirements for doctoral degree

The requirements for doctoral degree consist of on one hand passed examinations in the courses included in the approved individual study plan of each doctoral student, and on other hand passed public defense of the doctoral thesis. The program leading to the doctoral degree amounts to 240 higher education credits (four years of full-time studies), of which the thesis part amounts to a minimum of 120 higher education credits and the course part to a minimum of 40 higher education credits.

Requirements for licentiate degree

A stage of at least 120 higher education credits (two years of full-time studies) in the third level program may be completed with a licentiate degree. The requirements for this are that the doctoral student both has



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passed the examinations included in the program stage and has got an academic paper amounting to a minimum of 60 higher education credits passed. The course part amounts to a minimum of 20 higher education credits.

Other

The research within inorganic chemistry is conducted based on international collaborations and requires a significant global flow of information. It is therefore essential that the doctoral student is able to read and write scientific texts in English.