Department of Chemistry

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1. Introduction

The Department of Chemistry is comprised of approximately 150 undergraduate students, 250 graduate students, and 30 professors, all of who are involved in a variety of different majors and fields of research. Undergraduate students are educated to become balanced students in both theory and practice through courses in general chemistry, physical chemistry, organic chemistry, inorganic chemistry, analytical chemistry, biochemistry, materials chemistry, polymer chemistry, as well as numerous electives in order to gain depth of knowledge not only in the basic sciences, but also in cutting edge technology, and eventually make great contributions as an accomplished scientist. Therefore, all experiment courses are designed so that students can actively apply their accumulated knowledge and incorporate their educational experience in order to acquire laboratory skills. After completion of General chemistry lab courses, students are also offered lab courses in physical chemistry, organic chemistry, inorganic chemistry, analytical chemistry, biochemistry, materials chemistry, and polymer chemistry; each course is outfitted with equipment and resources that utilized currently their respective fields, and designed in a systematic and integrated manner that establishes a firm foundation for creative research.

The graduate program is active in multiple fields of research, including physical chemistry, organic chemistry, inorganic chemistry, polymer chemistry, analytical chemistry, biochemistry, nanobiochemistry, and many other chemistry-related fields. The M.S., integrated M.S./Ph.D, and Ph.D. programs train candidates to not only determine, but also rationally and independently resolve, critical issues in their prospective fields. Additionally, candidates are also trained in cutting edge skills through academic-industrial cooperation to become highly sought scientific pioneers that can contribute to advancement of the state. A variety of high-level chemistry courses is available to candidates, alongside multiple advisors spanning many different fields of research, which collectively encourages candidates to conduct and accomplish advanced research. Seminars and industrial opportunities also help widen the chemical perspectives of the candidates. Modern theories and resources are used as a foundation for the basic research being conducted at KAIST in conjunction with invited professors act as bridges for cooperation on not only a domestic, but also international level of research in both academia and industries, thus expanding opportunities for basic, as well as application-based education.

2. Scholarly and Research activity

The undergraduate program offers modern educational facilities as well as cutting edge equipment to emphasize both depth and breadth in learning. The department possesses over 100 types of equipment, such as IR, UV-VIS, and NMR spectroscopy machines, which play crucial roles in the students' education and research. Topics of research include, liquid structure and dynamics, membrane transport, statistical dynamics, molecular structure and property correlation, quantum chemistry, reaction dynamics, polymer properties, molecular adsorption and catalysis, synthesis and structural analysis of inorganic and organic materials, drug activity, biochemistry, synthesis of natural products, novel methods of organic synthesis, development of novel monomer and polymer structures, and many other scholarly and application-based fields. Various equipment is used to support such research, including GC, HPLC, GPC, 600, 400 and 300 MHZ FT-NMR, ESR, ESCA/AUGER, LEED VUV, UV/VIS, IR, LC/MS, and GC/MS, and the collection of resources being continually expanded to facilitate ongoing research.