Experiments in Chemistry

Syllabus Number 5E190
Special Subjects
Elective 1 credit
YANAGIHARA, Naohisa

1. Course Description

Chemistry is first and foremost an experimental science, and the importance of including practical work in the teaching program cannot be overemphasized. While practical work will not be assigned, it is nevertheless expected that students will have had hands-on laboratory experience.
This course is designed specifically for students who have registered in the teacher-training program. The purpose of this laboratory course is threefold: (1) To introduce the techniques and methods of general chemistry to students. (2) To allow the student to develop sophisticated laboratory skills. (3) To deepen the student's understanding of the principles of qualitative analysis.
Since laboratory space is limited, students will work in groups. However, each student must demonstrate individual mastery of the experiments and will be responsible for different aspects of the experiments. Details regarding laboratory safety regulations will be introduced on the first day of the course.
During the experiment, while the professor in charge is looking around, we will ask each student about the contents of the experiment each time, or accept questions from the students at any time and conduct experiments while deepening their understanding
This course corresponds to DP1, DP1, DP3, and DP4 of the Department of Biosciences.

2. Course Objectives

We aim to acquire introductory techniques and manner of experiments.
(1) You can master the properties and handling of various general chemical reagents.
(2) You can master the handling of various general laboratory glass-wares.
(3) By understanding the reactivity and chemical properties of representative alkali metals, alkaline earth metals, and heavy metal ions, you can acquire knowledge of qualitative analysis.

3. Grading Policy

(1) In principle, we will not accept late arrivals or absences (excluding sudden accidents or public reasons).
(2) Please attend all the experiments and submit an experiment report on the qualitative analysis of the unknown sample to be done in the final class time within the time limit.
(3) The evaluation of the report is subject to the sole evaluation criteria (100%). If incompleteness is confirmed in the submitted report, ask the creator of the report and submit a re-report.

4. Textbook and Reference

Textbook
Senjiro Maruta Fundamental Experiment of Chemistry Sankyo Shuppan
Reference
Distribute prints as appropriate.

5. Requirements(Assignments)

(1) Registration for teacher training courses is required.
(2) Be sure to prepare experiment notes.
(3) In the laboratory, it is obligatory to wear white gowns and goggles (students using eyeglasses are unnecessary).
(4) Eating and drinking in the laboratory are strictly prohibited.
(5) Unnecessary entry and exit during the experiment are not permitted.
(6) It is prohibited to shoot the content written on the blackboard or taking the video material of PowerPoint with a mobile phone or smartphone.

6. Note

7. Schedule

Safety Instruction, Reagent Preparation and Calculation Exercises.
Qualitative Analysis of Metal Cations of Group 1 :
Silver (I) and Lead (II) Ions, and Their Systematic Separation and Detection.
Qualitative Analysis of Metal Cations of Group 2 :
Copper (II), Cadmium (II) and Lead (II) Ions, and Their Systematic Separation and Detection.
Qualitative Analysis of Metal Cations of Group 3 :
Iron (III) and Chromium (III) Ions, and Their Systematic Separation and Detection.
Qualitative Analysis of Metal Cations of Group 4 :
Nickel (II) and Zinc (II) Ions, and Their Systematic Separation and Detection.
Qualitative Analysis of Metal Cations of Group 5 and Group 6 :
Barium (II), Calcium (II) and Sodium Ions, and Their Systematic Separation and Detection.
Exam of Qualitative Analysis of Unknown Sample.