Chemistry1

Syllabus Number 2G108
Basic Major Subjects
Requisites 2 credit
YAMADA, Satoshi

1. Course Description

Chemistry 1 (this course) and Chemistry 2 (held in the second semester) aim to allow students of the Faculty of Science and Technology to acquire a basic knowledge of chemistry and the ability to think in terms of chemistry, which are necessary for studying specialized subjects and conducting graduation research. In Chemistry 1, the structure of matter (<1> the constituent particles of matter and the amount of matter, <2> electron configurations and the periodic table, <3> chemical bonding), states of matter (<4> changes in states of matter, <5> the properties of gases, <6> solutions), and changes in matter (<7> chemical reactions and heat) are studied. In Chemistry 2, the remaining sections of changes in matter (reaction rates and chemical equilibrium, acids and bases and their reactions, oxidation and reduction reactions, batteries and electrolysis) and inorganic compounds (the properties of non-metallic elements, the properties of metallic elements) are studied.

2. Course Objectives

Chemistry 1 (this course) and Chemistry 2 (held in the second semester) aim to allow students of the Faculty of Science and Technology to acquire a basic knowledge of chemistry and the ability to think in terms of chemistry, which are necessary for studying specialized subjects and conducting graduation research.

3. Grading Policy

Performance is evaluated based on in-class quizzes (30%) and periodic examinations (70%).
Overall feedback is provided and test answers are explained during the final lecture.

4. Textbook and Reference

Textbook
Textbook: 井口洋夫　他　共著　『基礎シリーズ　化学入門』実教出版　ISBN978-4-407-03148-5

5. Requirements(Assignments)

Before class: Read in advance the scope of the next lecture in the designated textbook, and sort out the points that you do not understand or have issues with before attending the class. (1 hour)
After class: Revise your answers to the quiz held during the previous class, and then make sure you can completely answer the quiz without looking at the answers. (2 hours)

6. Note

Prepare the special notes for this class and a scientific calculator (required when doing the quizzes).

7. Schedule

[1] Constituent particles of matter, and amount of matter (atoms, molecules, ions, and amount of matter)

[2] Constituent particles of matter, and amount of matter (chemical reaction equations, quantitative relationships, quiz)

[3] Electron configurations and the periodic table (electron shells, electron configurations, creation of ions)

[4] Electron configurations and the periodic table (periodic table of the elements, quiz)

[5] Chemical bonding (ionic bonding, ionic crystals, covalent bonding, molecular structure, polarity, hydrogen bonding)

[6] Chemical bonding (molecular crystals, covalent bonding crystals, metallic bonding, metal crystals, quiz)

[7] Changes in states of matter (particle motion, state changes)

[8] Changes in states of matter (structure of matter, melting point, boiling point,quiz)

[9] Properties of gases (combined gas law)

[10] Properties of gases (state equations of gases, quiz)

[11] Solutions (solutions, solubility, properties of dilute solutions)

[12] Solutions (colloids, quiz)

[13] Chemical reactions and heat (heat of reaction, thermochemical equations)

[14] Chemical reactions and heat (Hess's law, binding energy, quiz)

[15] Test, summary