

Chemistry2

Syllabus Number

1A206

Basic Major Subjects

Elective Requisites 2
credit

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1. Course Description

Chemistry is the science to study materials, and it is one of the sciences that a person dealing with substances must learn. For students who do not specialize in chemistry in the future, it is also impossible to avoid chemical substances and many substances obtained from them in real life.

As the follow-up course to Chemistry 1, learning topics for students taking Chemistry 2 will be acid and base, redox reaction, chemical reaction rate, and also the foundation of chemical thermodynamics. The lecture is planned to be in line with the text content while using OHC and board book in combination. In addition, although this class is mainly lecture type, we will shortly discuss questions on exercise problems or lecture contents within the lecture time.

In this lesson, you can acquire knowledge and ability on DP1, DP3, and DP4 of the Department of Mechanical Precision Systems Engineering.

2. Course Objectives

- (1) By understanding the concept of acid and base, you can acquire knowledge about each property.
- (2) By understanding the concepts of oxidation and reduction, you can acquire knowledge in applying them.
- (3) You can master the fundamentals of thermodynamic thinking that is the foundation of every field.

3. Grading Policy

- (1) Attendance confirmation is taken in each time, and students who do not attend more than 2/3 classes are not allowed to take the regular exam.
- (2) The results of the mid-term exam and the regular exam will be 50% each, and they will be combined into the final evaluation.
- (3) It is planned to answer and explain the exercises in the textbook and handouts, and also to confirm the degree of progress of understanding appropriately.

4. Textbook and Reference

Textbook

Hiroyasu Shibahara and Masaharu Saito The Intermediary to the University: General Chemistry
Kagaku Dojin

Reference

Not particularly. We will distribute prints as appropriate.

5. Requirements(Assignments)

- (1) Please be sure to enter the room at least within 30 minutes. Students who are late more than 30 minutes are allowed to attend, but will be considered as absent.
- (2) Eating and drinking during lectures and unnecessary entry and exit are not permitted.
- (3) 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

- [1] Chemical Kinetics (1): Reaction Rates.
- [2] Chemical Kinetics (2): Reaction Mechanisms.
- [3] The Basis of Chemistry (3): Activation Energy.
- [4] Acids and Bases (1): Definition of Acid and Base.
- [5] Acids and Bases (2): Equilibria in Solution.
- [6] Acids and Bases (3): Hydrogen ion concentration and pH.
- [7] Acids and Bases (4): Acid-Base Titration.
- [8] Mid-term exam.
- [9] Oxidation and Reduction (1): Definition of Oxidation and Reduction.
- [10] Oxidation and Reduction (2): Ionization Tendency.
- [11] Chemical Thermodynamics (1): The First Law of Thermodynamics.
- [12] Chemical Thermodynamics (2): Enthalpy and Energy.
- [13] Chemical Thermodynamics (3): The Second Law of Thermodynamics.
- [14] Chemical Equilibria: Equilibria and Free Energy.
- [15] Summary and Exams.