

Chemistry2

Syllabus Number 5A104
Basic Major Subjects
Requisites 2 credit
UCHIDA, Kenichi

1. Course Description

This course introduces the students taking this course about foundations of chemistry necessary to understand a variety fields of biosciences.

2. Course Objectives

The goals of this course are to be able to understand properties of solution, acids and bases, redox reactions, chemical reaction rates and basic thermodynamics.

3. Grading Policy

Your overall grade in the class will be decided based on the following:

- Term-end examination: 70%
- mini-examinations: 30%

4. Textbook and Reference

Textbook

Yoshio Masuda and Kiyoshi Sawada, "Rikei no tameno kiso kagaku"
Kagakudoujin, (ISBN978-4-7598-1055-4)

5. Requirements(Assignments)

Nothing in particular.

6. Note

7. Schedule

- [1] Introduction of chemistry : SI unit system
- [2] Properties of solution 1 : various concentrations
- [3] Properties of solution 2 : dilute solutions, the law of Raoult
- [4] Properties of solution 3 : rise of boiling point, depression of freezing point, osmotic pressure
- [5] Acids and bases 1 : several definitions of acids and bases
- [6] Acids and bases 2 : pH and pKa
- [7] Redox reactions 1 : oxidants and reductants, oxidation number
- [8] Redox reactions 2 : Redox potential and chemical batteries
- [9] Chemical reaction rates 1 : first order reactions
- [10] Chemical reaction rates 2 : Reaction rates vs. temperature, concentration and catalysts. the equation of Arrhenius
- [11] Thermodynamics 1 : Heat and work, internal energy
- [12] Thermodynamics 2 : The first law of thermodynamics, PV work, enthalpy
- [13] Thermodynamics 3 : Heat of reactions, the law of Hess
- [14] Thermodynamics 4 : The second law of thermodynamics, entropy, free energy
- [15] Summary and final examination