Advanced Separation Technology

2 units (selection)

Masahiro Katoh · Associate Professor / Synthetic and Polymer Chemistry, Chemical Science and Technology, Earth and Life Environmental Engineering
Toshihide Horikawa · Associate Professor / Chemical Process Engineering, Chemical Science and Technology, Earth and Life Environmental Engineering

Target〉 The purpose of this class is to understand typical separation processes, the concepts and mathematical treatments for mass transfer.

Outline〉 Separations are prominent in manufacture of chemicals, pharmaceuticals, metals etc. Various separation methods have been developed in chemical industry. Separations are also needed for treatment of hazardous wastes and for pollution control, especially for recycle and recovery of resources. The following types of systems will be discussed: principal of various separation methods, fundamentals of mass transfer, separation with phase change, gas absorption with chemical reactions, extraction, adsorption and ion exchange, membrane separation, methods of continuous separation. Mathematical treatments will include methods of characteristics and moment analysis. To facilitate understanding and practical application, a practice or a report will be also imposed on every item.

Style〉 Lecture

Keyword〉 ***mass transfer, separation processes***

Notice〉 授業を受ける際には，2時間の授業時間毎に2時間の予習と2時間の復習をした上で授業を受けることが，授業の理解と単位取得のために必要である．

Goal〉

1. To understand several separation processes
2. To understand mathematical treatments for mass transfer

Schedule〉

1. Several separation processes and the concepts
2. Mass transfer
3. Gas absorption, steady analysis
4. Gas absorption, unsteady analysis
5. Gas absorption with chemical reaction
6. Gas absorption apparatuses
7. Adsorption equilibrium
8. Adsorption velocity and diffusion
9. Chromatography
10. Moment analysis
11. The principle of membrane separation
12. Membrane permeability
13. Membrane separation process, module
14. Membrane separation process, gas separation
15. Continuous membrane separation process

Evaluation Criteria〉 Assignment counts 100% mainly based on the report submitted.

Contents〉 http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216883

Contact〉

⇒ Katoh (M304, +81-88-656-7429, katoh@chem.tokushima-u.ac.jp) Mail