Syllabus

Special Topics in Functional Materials for Water Treatment

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	Position	Assistant Professor				
	Group	Environmental and safety Engineering			Major	Environmental Engineering

1. Course Description

Recently, environmental materials as a new field of material science have attracted much attention. Application of functional materials, both natural and synthetic, is becoming increasingly popular in water purification. With rapid industrial development and accelerated urbanization, environmental pollution has been getting worse, but conventional treatment technologies often cannot satisfy the growing public demand for a healthy environment. One way of doing this is the application of functional materials, and it is expected to greatly enhance the efficiency of traditional treatment processes, thereby facilitating improvement in water quality. Thus, this lecture will address adsorbents and ion exchangers as functional materials for water treatment.

2. Teaching Methods

Lecture & Assignment

3. Evaluation

Attendance: 10%
Assignment: 20%
Mid-term: 35%
Final Exam: 35%

4. TextBooks

5. Lecture Schedule

Week	Lecture contents	Lesson type	Remark
1	Introduction		
2	Fundamental Factors for Designing Adsorbent		
3	Sorbent Selection		
4	Pore Size Distribution		
5	Activated Carbon		
6	Silica Gel, MCM, and Activated Alumina		
7	Zeolites and Molecular Sieves		
8	Mid-term		
9	Ion Exchange and Ion Exchanger		
10	Ion Exchange Fundamnetals (1)		
11	Ion Exchange Fundamnetals (2)		
12	Ion Exchange Kinetics (1)		
13	Ion Exchange Kinetics (2)		
14	Hybrid Exchange Nanotechnology		
15	Heavy Metal Chelation and Polymeric Ligand Exchange		
16	Final Exam		

6. Others