

课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	课程名称 Course Title	环境化学实验 Environmental Chemistry Laboratory
2.	授课院系 Originating Department	环境科学与工程学院 School of Environmental Science and Engineering
3.	课程编号 Course Code	ESE207
4.	课程学分 Credit Value	1
5.	课程类别 Course Type	专业限选课 Major Elective Courses
6.	授课学期 Semester	春季 Spring
7.	授课语言 Teaching Language	中文 Chinese
8.	授课教师、所属学系、联系方式 Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	熊鹰, 环境科学与工程学院, xiongy@sustech.edu.cn ; Ying Xiong, School of Environmental Science and Technology, xiongy@sustech.edu.cn
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact	待公布 To be announced
10.	选课人数限额(可不填) Maximum Enrolment (Optional)	

11. 授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other (Please specify)	总学时 Total
学时数 Credit Hours			32		32
12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	先修课 Pre-requisite: 环境化学 Environmental Chemistry				
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	无 N/A				
14. 其它要求修读本课程的学系 Cross-listing Dept.	无 N/A				

教学大纲及教学日历 SYLLABUS

15. 教学目标 Course Objectives

本课程教学是《环境化学》理论课附属的实验课程，主要围绕对污染物在环境中的来源、迁移、转化、效应、归趋等环境化学行为设置，帮助学生加深理解环境化学中涉及的科学原理和基本内容，同时培养学生良好的环境化学实验技能，达到理论与实践相结合的目的。

This course is the laboratory part of environmental chemistry course. The laboratory parts mainly focuses on the environmental chemistry behaviour of pollutants, including origin, transportation, transformation, effect and fate in environment. Based on this course, the students are expected to understand the fundamental principles and basic knowledge involved in environmental chemistry. At the same time, the course cultivates students' practical environmental chemistry experimental skills.

16. 预达学习成果 Learning Outcomes

本实验课程的基本要求是让学生通过本课程的学习，理解污染物在环境中的行为和变化，掌握基本的环境化学实验原理及操作方法，能够相对独立地完成较简单的环境化学实验。

The basic requirement of this laboratory course is to enable students to understand the environmental behaviour of pollutants in environment based on this course, to master the basic principles and operation methods of environmental chemistry experiments.

17. 课程内容及教学日历 (如授课语言以英文为主, 则课程内容介绍可以用英文; 如团队教学或模块教学, 教学日历须注明主讲人)

Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

教学内容: Content

实验一 水中碱度的测定 (4 学时)

Determination of alkalinity in water (4 class hours)

用标准浓度的酸溶液定水样, 用酚酞和甲基橙做指示剂, 根据指示剂颜色的变化判断终点。根据所消耗的酸量, 计算出水样的碱度。

The standard concentration of acid solution was used to determine the water sample. The phenolphthalein and methyl orange were used as indicators, and the end point was judged according to the change of indicator colour. The alkalinity of the water sample is calculated according to the amount of acid consumed.

实验二 水的总硬度测定 (4 学时)

Determination of total hardness of water (4 class hours)

采用络合滴定法, 用 EDTA 标准溶液直接滴定水中 Ca、Mg 总量, 最后换算出相应的硬度单位。

The total amount of Ca and Mg in water were titrated directly with EDTA standard solution by complex titration, and the corresponding hardness units were converted.

实验三 甲基橙光催化降解反应动力学 (4 学时)

The kinetics of photocatalytic degradation of methyl orange (4class hours)

测定甲基橙在不同光源作用下的光催化降解反应速率常数。

The photocatalytic degradation rate constant of methyl orange under different light sources was determined.

实验四 芬顿反应 (4 学时)

Fenton reaction (4 class hours)

采用亚铁离子与过氧化氢组成的芬顿试剂生成强氧化性的羟基自由基, 用来氧化处理模拟染料废水, 探究影响芬顿试剂氧化能力的影响因子。

Ferrous ion and hydrogen peroxide compose Fenton reagent, which could produce strong oxidizing hydroxyl radical.

Fenton reagent is used to oxidize and treat simulated dye wastewater and to explore the influencing factors affecting the oxidation ability of Fenton reagent.

实验五 沸石吸附重金属 (4 学时)

Zeolite adsorb heavy metal (4 class hours)

研究活性沸石对废水中 Cu 等重金属离子的吸附作用, 了解吸附机理。

Using active zeolites to adsorb heavy metal ions in wastewater such as Cu. Understanding the adsorption mechanism.

实验六 大气颗粒物的采集及样品制备 (4 学时)

Atmospheric particulate matter collection and sample preparation (4 class hours)

采用滤膜捕集-重量法, 采集大气中悬浮颗粒物, 测定大气 TSP, 并制备颗粒物样品。

Using filter membrane capture gravimetric method to collect suspended particulate matter in atmosphere. The atmospheric TSP was determined and particulate matter samples were prepared.

实验七 大气颗粒物的组成及形态分析 (4 学时)

Composition and morphological analysis of atmospheric particulate matter (4 class hours)

通过环境扫描电镜对大气颗粒物的显微形貌、粒径分布和化学元素进行分析，判断大气颗粒物的化学组成和来源。

The microstructure, particle size distribution and chemical elements of atmospheric particles were analyzed by environmental scanning electron microscope. The scanning results are used judge the chemical composition and source of atmospheric particles.

实验八 土壤阳离子交换量的测定 (4 学时)

Determination of cation exchange capacity in soil (4 class hours)

通过阳离子 Ba^{2+} 与土壤中存在的各种阳离子等价交换，计算出土壤中阳离子的交换总量。

Using cation Ba^{2+} to equivalently exchange with various cations in soil, then calculates the total amount of cation exchange in soil.

18. 教材及其它参考资料 Textbook and Supplementary Readings

《环境化学实验技术》，李国东，刘伟，李亚宁，南开大学出版社

《Environmental Chemistry Experimental Technology》，Li Guodong, Liu Wei, Li Yaning, Nankai University Press

《环境化学实验》，吴峰，武汉大学出版社

《Environmental Chemistry Experiment》，Wu Feng, Wuhan University Press

课程评估 ASSESSMENT

19. 评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		10		
课堂表现 Class Performance		20		
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments		60		实验报告 Experiment Report
期中考试 Mid-Term Test				
期末考试 Final Exam				
期末报告 Final Presentation				
其它 (可根据需要 改写以上评估方 式) Others (The above may be modified as necessary)		10		实验预习报告 Experiment Preview Report

20. 记分方式 GRADING SYSTEM

- A. 十三级等级制 Letter Grading
 B. 二级记分制（通过/不通过） Pass/Fail Grading

课程审批 REVIEW AND APPROVAL

21. 本课程设置已经过以下责任人/委员会审议通过
This Course has been approved by the following person or committee of authority