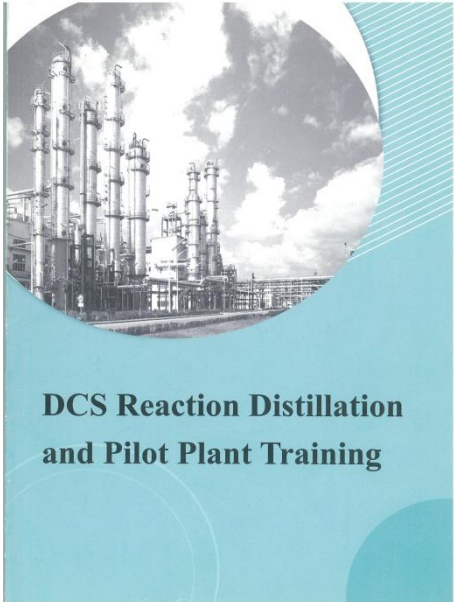
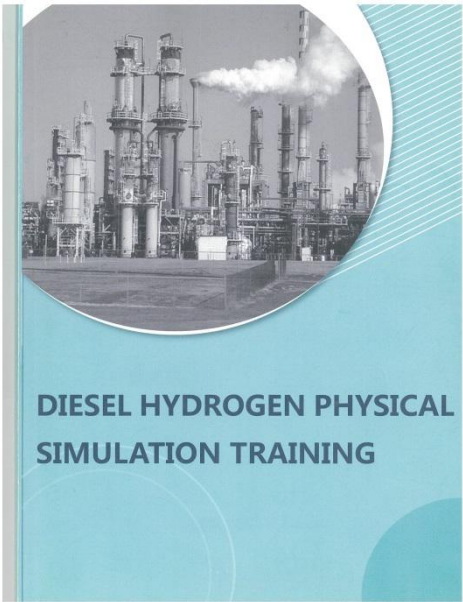
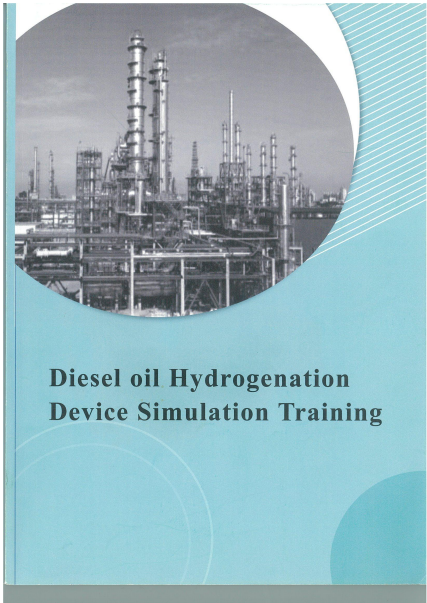
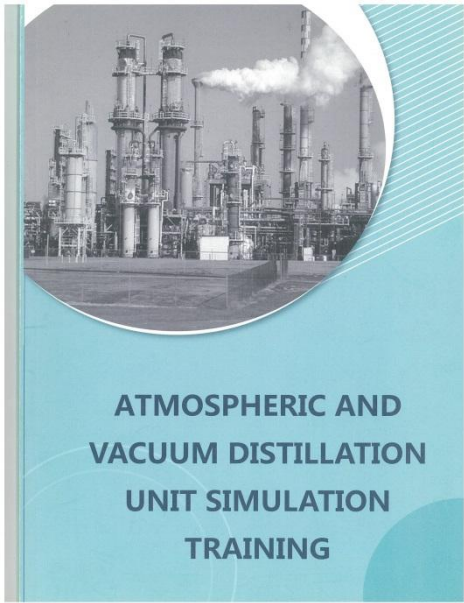
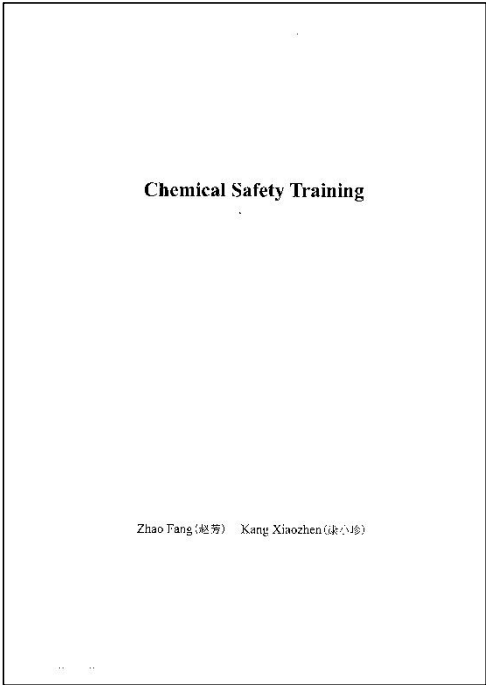
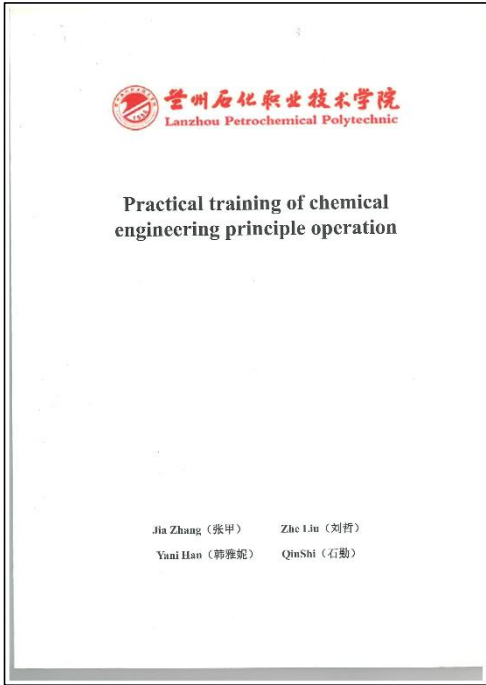


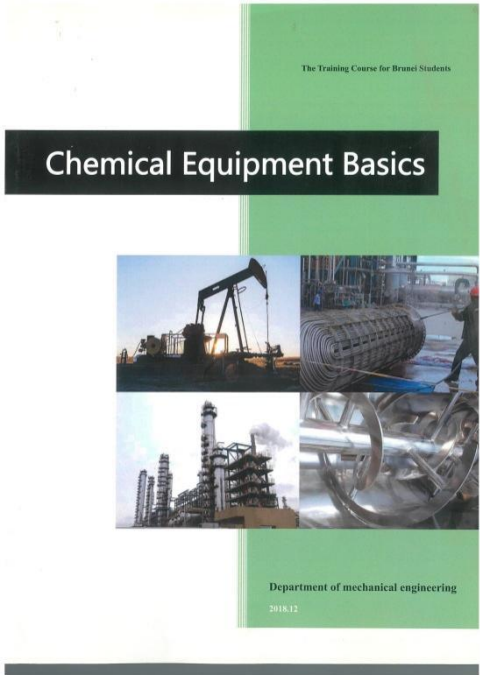
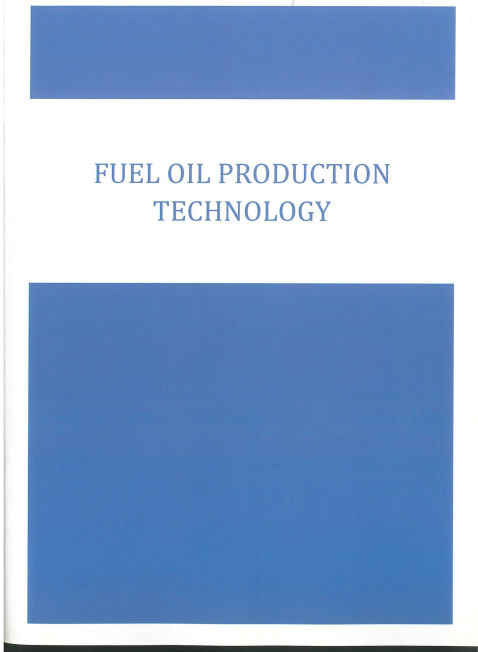
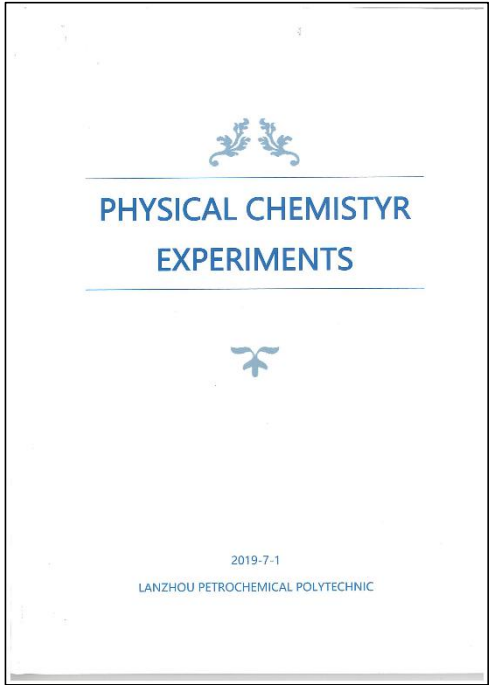
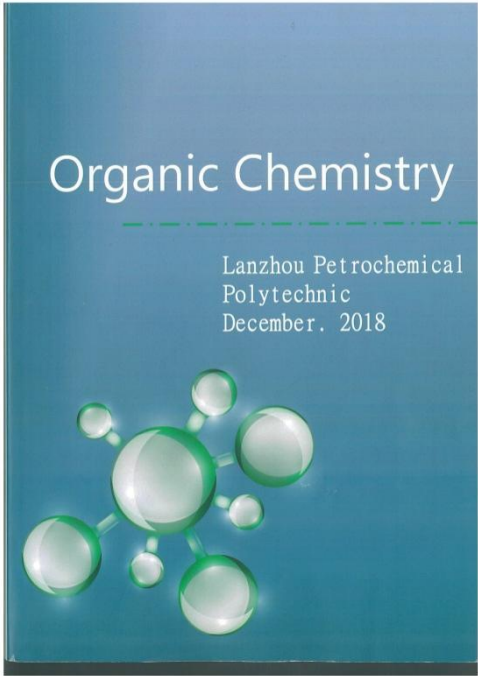
二、教学资源

(一) 自编英文讲义

表 1. 部分自编英文讲义

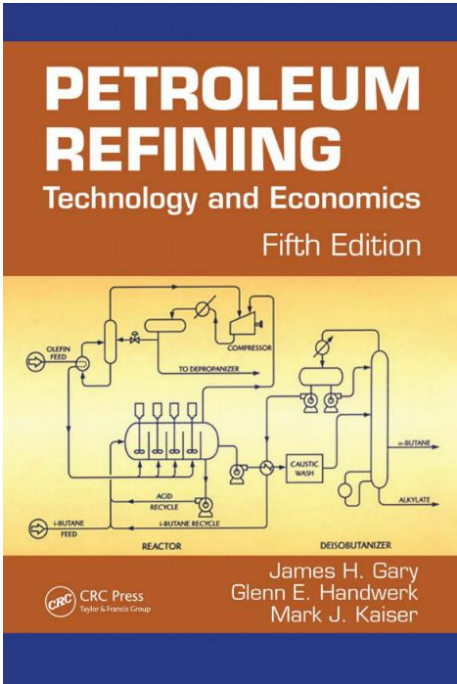
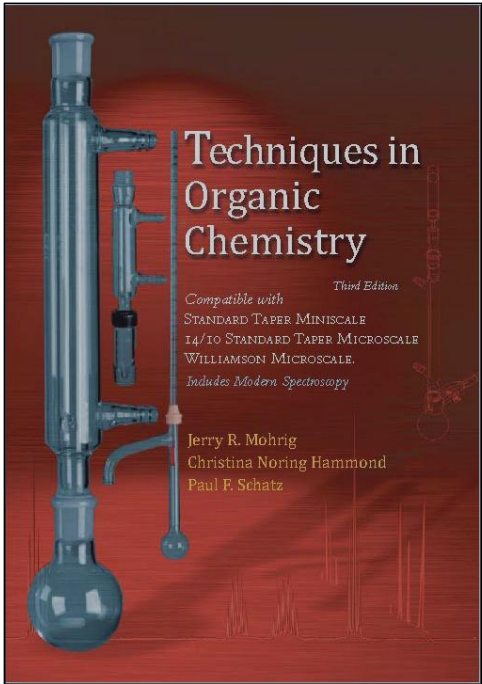
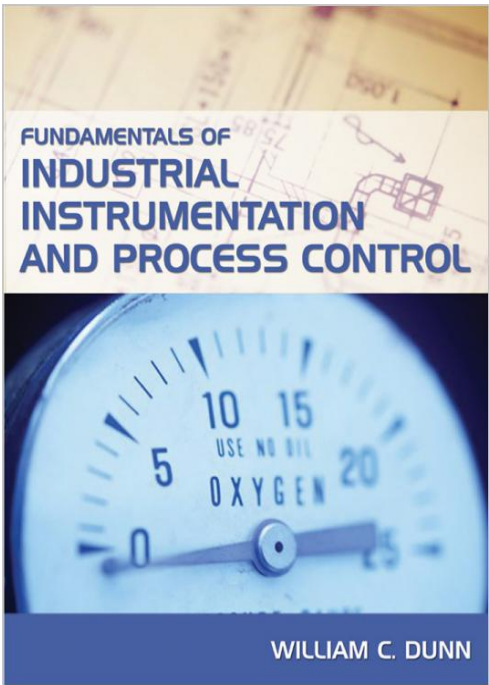
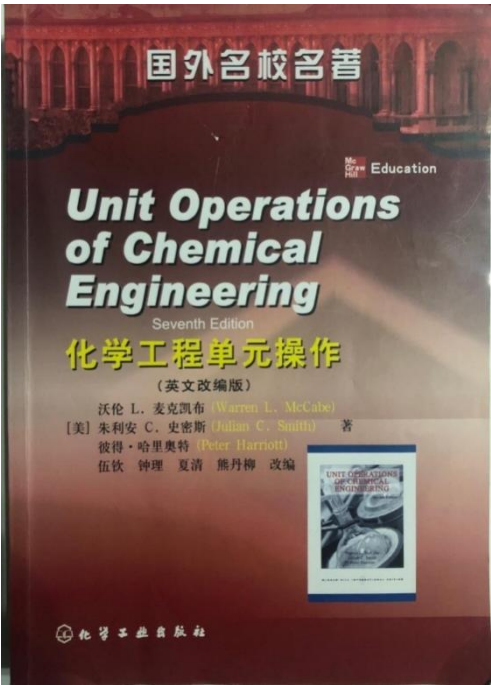
DCS 反应精馏及中试装置实训	柴油加氢半实物仿真实训
 DCS Reaction Distillation and Pilot Plant Training	 DIESEL HYDROGEN PHYSICAL SIMULATION TRAINING
柴油加氢装置仿真实训	常减压蒸馏仿真实训

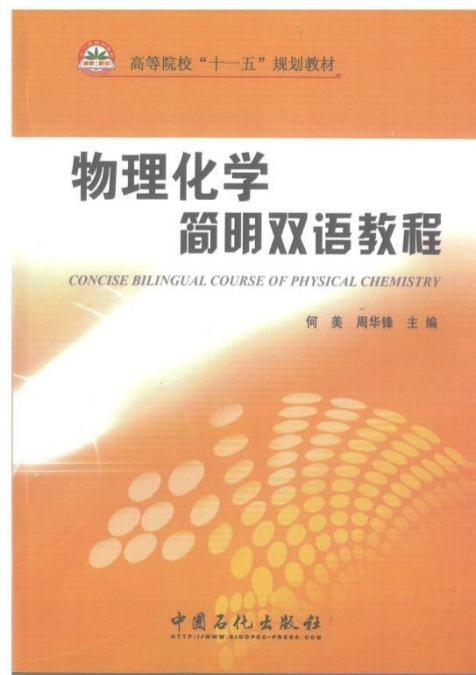
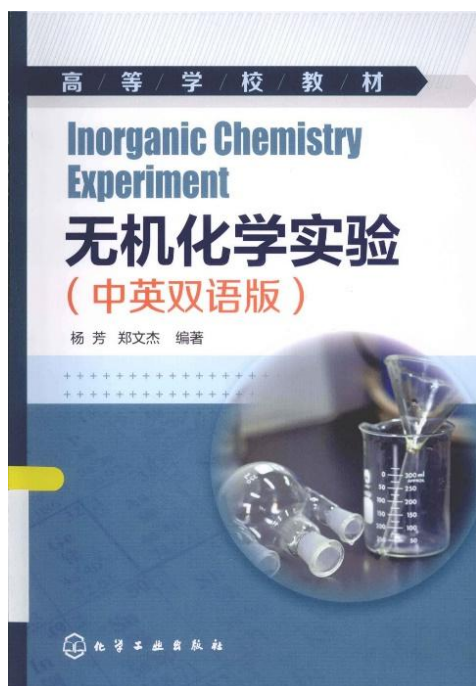
 Diesel oil Hydrogenation Device Simulation Training	 ATMOSPHERIC AND VACUUM DISTILLATION UNIT SIMULATION TRAINING
化工安全实训	化工单元设备操作实训
 Chemical Safety Training Zhao Fang (赵芳) Kang Xiaozhen (康小珍)	 兰州石化职业技术学院 Lanzhou Petrochemical Polytechnic Practical training of chemical engineering principle operation Jia Zhang (贾甲) Zhe Liu (刘哲) Yani Han (韩雅妮) QinShi (石勤)
化工设备基础	燃料油生产技术

	
物理化学	有机化学
	

(二) 引进国外教材及双语教材

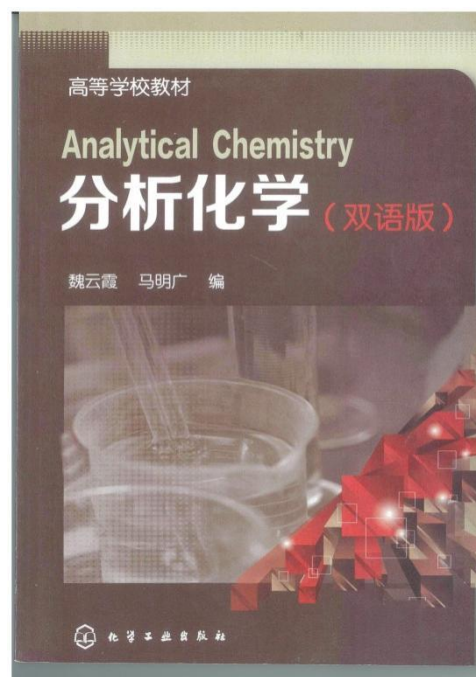
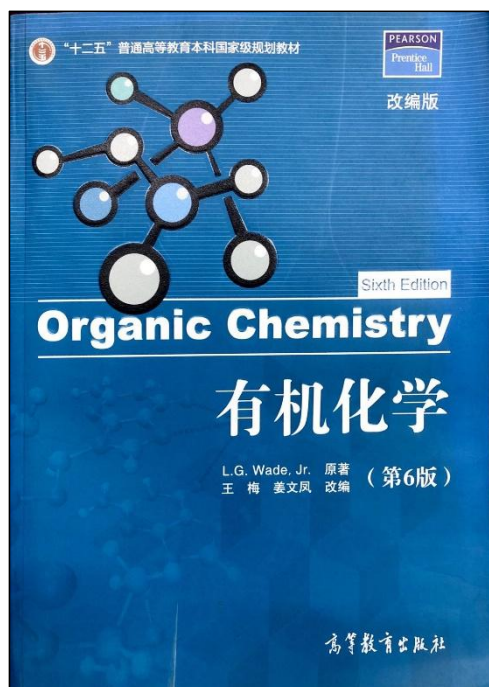
表 2. 引进国外教材及双语教材

石油炼制技术	有机化学实验
	
工业仪表和过程控制	化学工程单元操作
	
无机化学实验	物理化学



有机化学

分析化学



(三) 教案

表 3. 部分授课教案节选

DCS 反应精馏及中试装置实训

DCS 反应精馏及中试装置实训

催化裂化仿真实训教案

[illegible]

催化重整仿真实训

[illegible]

石油及产品概论

Lanzhou Petrochemical Polytechnic

Teaching Plan
(The first term)

Department: College of Petrochemical Engineering
 Course name: Introduction to Oil & Product ...
 Teacher's name: Zhang Hailiang, Tian Hua

无机化学实验

Lanzhou Petrochemical Technical College

Teaching Plan
(The first term)

Department: College of Petrochemical Engineering
 Course name: Experiment of inorganic chemistry
 Teacher's name: Anqi Wang, Xing Zhang

Class schedule of Lanzhou Petrochemical Polytechnic

Class	Teacher	Time	Room
1. Inorganic chemistry experiment	...	...	...
2. Inorganic chemistry experiment	...	...	...

兰州石化职业技术学院备课纸

Experiment 2 Purification of Copper (II) Sulfate

Objectives

1. To understand the chemical techniques for purification of copper sulfate.
2. To practice the basic operation of purifying organic compounds.

Introduction

$$2Fe^{2+} + H_2O_2 + 2H^+ \rightarrow 2Fe^{3+} + 2H_2O$$

$$Fe^{3+} + 3OH^- \rightarrow Fe(OH)_3$$

原油蒸馏装置实训

Lanzhou Petrochemical Polytechnic

Teaching Plan
(The first term)

Department: College of Petrochemical Engineering
 Course name: Crude Oil Distillation Unit Training
 Teacher's name: Su Xuechao, Ma Ya

Class schedule of Lanzhou Petrochemical Polytechnic

Class	Teacher	Time	Room
1. Crude oil distillation unit training	...	...	...
2. Crude oil distillation unit training	...	...	...

兰州石化职业技术学院备课纸

Project 5 Atmosphere and Vacuum Crude Distillation Unit

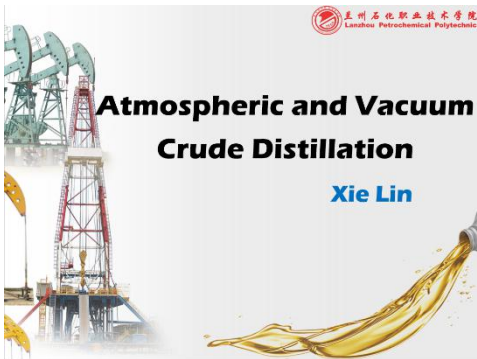
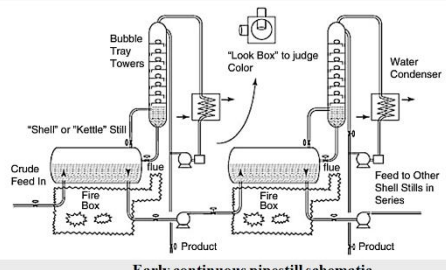
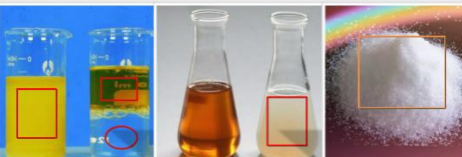
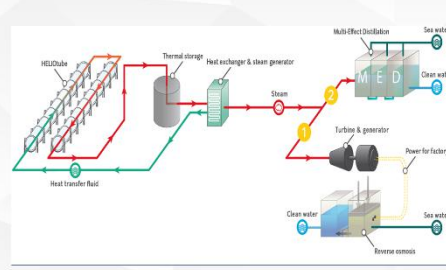
Objectives

1. To understand the basic operation of the atmosphere and vacuum crude distillation unit.
2. To practice the basic operation of the atmosphere and vacuum crude distillation unit.

Introduction

(四) 课件

表 4. 部分多媒体课件节选

燃料油生产技术	
 Atmospheric and Vacuum Crude Distillation Xie Lin	The production of early distillates was made by cascading the crude oil through successive stills, each operating at successively higher temperatures.  Early continuous pipestill schematic
Introduction of crude oil distillation Distillation is the separation of crude oil in atmospheric and vacuum distillation columns into groups of hydrocarbon compounds based on molecular size and boiling-point ranges. 	Desalting crude oil Existence form of salt - dissolved - suspended salt crystals 
身边的化学	
The guarantee of baby's quite sleep — The secret of Diapers College of Petrochemical Engineering Xinjie Zhang	1 The development of diaper  Improved style, gradually applied to life, widely used Children, the elderly, including pets, have corresponding diapers or tablet products In the 1980s, Tang Xinyuan, a Chinese, improved his spacersuit and invented a kind of super absorbent diaper 尿不湿 The three astronauts also used special diapers
1. Where does formaldehyde in life come from? 生活中的甲醛来自哪里  生活中的甲醛来自哪里?	二、海水淡化技术 1 多效蒸馏法 

危险化学品安全



兰州石化职业技术学院

Safety of Hazardous Chemicals

Explainer: Linhong Jiao; Xingguang Wang

College of Petroleum Chemical Engineering

1. Introduction

1.1 Introduction to the course

1. Political Education



What is the Chinese Dream?

The core goal of the "Chinese Dream" can also be summarized as the goal of "two hundred years", that is, by the 20th anniversary of the founding of the Communist Party of China in 2021 and the 100th anniversary of the founding of the People's Republic of China in 2049, the Chinese nation will gradually and eventually be realized Great revival.

The concrete manifestations are the prosperity of the country, the rejuvenation of the nation, and the happiness of the people.

The way to achieve this is to follow the path of socialism with Chinese characteristics, adhere to the theoretical system of socialism with Chinese characteristics, carry forward the national spirit, and consolidate Chinese power.

The means of implementation is the five-in-one construction of politics, economy, culture, society and ecological civilization.

无机化学



Inorganic chemistry

Teacher: Xiayajun

Chapter 1 General knowledge

* History of inorganic chemistry

Early stage:

1st AD: Alchemists were active in China, Egypt, and other centers of civilization early;

1150 AD: Gunpowder was used in Chinese fireworks;
17th century: the common strong acids (nitric, sulfuric, and hydrochloric) were known, and more systematic descriptions of common salts;

Chapter 1 General knowledge

* Review of basic chemistry

Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period	1	H	He															
2	Li	Be	B	C	N	O	F	Ne										
3	Na	Mg	Al	Si	P	S	Cl	Ar										
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
7	Fr	Ra	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	

*Lanthanoids

**Actinoids

Chapter 1 General knowledge

* Review of basic chemistry

Some common chemical parameters

(2) the amount of substance

It is often convenient to use the mole to describe the amount of substance which represents for n and in unit of mole.

$$n = \frac{N}{N_A}$$

N is the number of molecules, N_A is Avogadro constant, which is the number of molecules per mole, the value of N_A is $6.02 \times 10^{23} \text{ mol}^{-1}$.

物理化学



Physical Chemistry

Chapter 1 Introduction

Anqi Wang & Xinjie Zhang

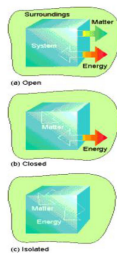
0. Basic concepts

Systems

(a) **An open system:** can exchange matter and energy with its surroundings.

(b) **A closed system:** can exchange energy with its surroundings, but it cannot exchange matter.

(c) **An isolated system:** can exchange neither energy nor matter with its surroundings.



Organic Chemistry

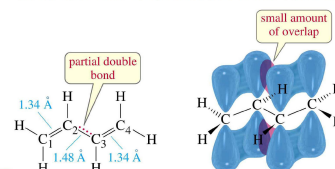
Chapter 4

Conjugated Systems and Orbital Symmetry

HONG TIAN
Lanzhou Petrochemical Polytechnic
December, 2018

Structure of 1,3-Butadiene

- Most stable conformation is planar.
- Single bond is shorter than 1.54 Å.
- Electrons are delocalized over molecule.



5

ORGANIC CHEMISTRY

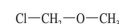
Chapter 9 Ethers, Epoxides

Man LiLi

9-1-2 IUPAC Names

IUPAC names use the more complex alkyl group as the root name, and the rest of the ether as an alkoxy group.

Examples:



IUPAC name: methoxyethane

methoxybenzene

chloromethoxymethane

common name: ethyl methyl ether

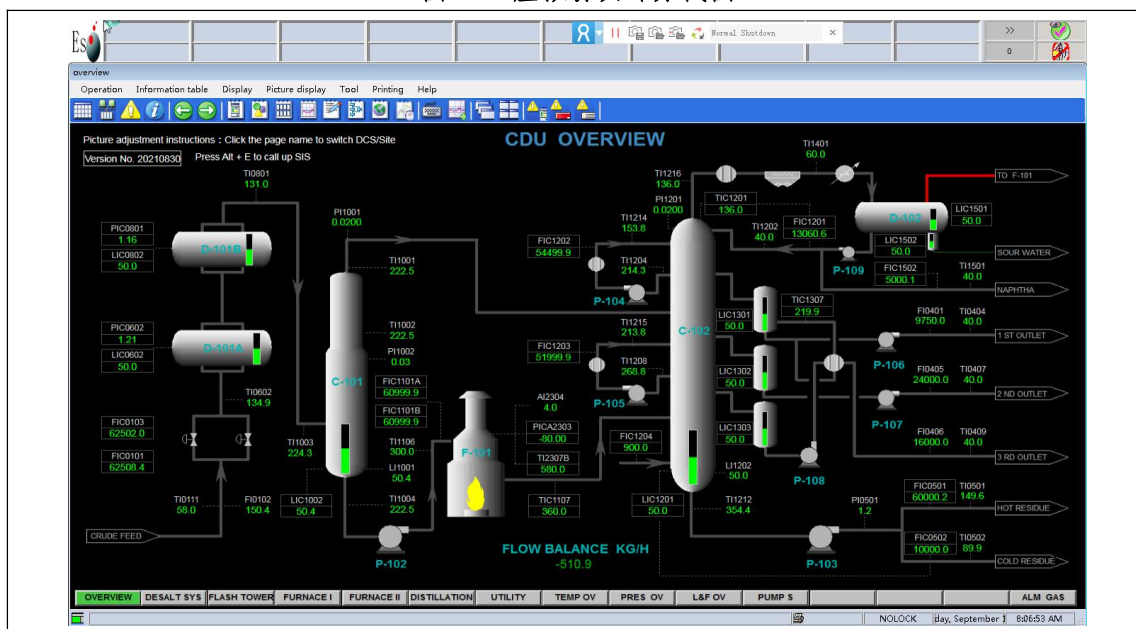
methyl phenyl ether,

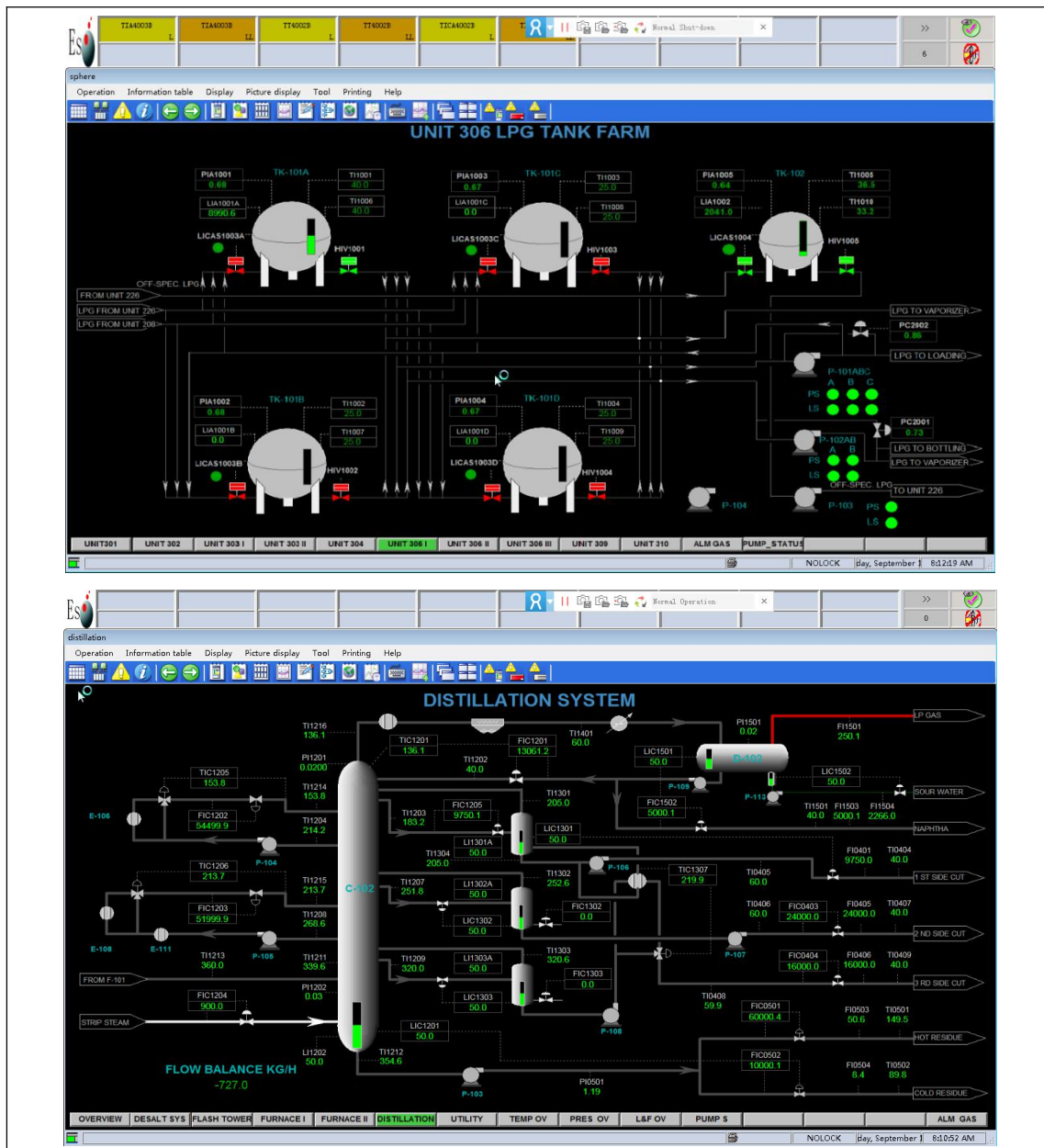
chloromethyl methyl ether

or anisole

(五) 虚拟仿真

图 11. 虚拟仿真部分截图





（六）数字化课程资源

图 12. 数字化课程资源

24 门课程数字资源建设明细					
总牵头单位（乙方） 兰州石化职业技术学院					
序号	课程名称	承担单位	项目负责人	类型	计划交付时间
1	有机化学（补充）	石化学院	索晓宁	在线题库	2018.3.30
2	石化原料生产技术（补充）	石化学院	周艳青	在线课程	2018.3.30
3	石油化工生产技术（补充）	石化学院	赵立祥	在线课程	2018.3.30
4	高聚物生产技术（补充）	石化学院	石星丽	在线课程	2018.3.30
5	有机化学（补充）	石化学院	田红	在线课程	2018.3.30
6	物理化学（补充）	石化学院	王安琪	在线课程	2018.3.30
7	煤化学（补充）	应化学院	赵宏林	在线课程	2018.3.30
8	煤化工生产技术（补充）	应化学院	侯侠	在线课程	2018.3.30
9	化工反应原理及设备（补充）	应化学院	王雪香	在线课程	2018.3.30
10	化工安全技术（补充）	应化学院	王宏	在线课程	2018.3.30
11	有机化工生产技术（补充）	应化学院	王焕梅	在线课程	2018.3.30
12	化工机器（补充）	机械学院	倾明	在线课程	2018.3.30
13	石油化工生产技术	石化学院	李薇	在线题库	2018.3.30
14	高聚物生产技术	石化学院	罗资琴	在线题库	2018.3.30
15	化学分析	石化学院	冷宝林	在线题库	2018.3.30
16	化工制图	机械学院	刘立平	在线题库	2018.3.30
17	汽车底盘构造与维修	汽车学院	郑劲	在线题库	2018.3.30
18	化工设备基础	机械学院	赵忠亮	在线课程	2018.11.30
19	密封技术及应用	机械学院	吴笛	在线课程	2018.11.30
20	化工腐蚀与防护	机械学院	史立军	在线课程	2018.11.30
21	石化基础	石化学院	李薇	在线课程	2018.11.30
22	水污染控制技术	石化学院	夏德强	在线课程	2018.11.30
23	计算机基础	教务处	宋贤钧	在线课程	2018.11.30
24	语文	马克思学院	谷荣	在线课程	2018.11.30

石油化工生产技术 李强等

课程章节

- 石油炼制
 - 1.1 石油炼制的生产原理
 - 1.2 石油炼制的原料
 - 1.3 石油炼制的操作条件
 - 1.4 石油炼制的工艺流程
 - 1.5 生产过程中的异常现象
 - 1.6 化工生产过程中开车、停车的一般要求
 - 1.7 在线题库平台

课程评价: ★★★★★ 5.0 (1A/RP)

课程PV: 82626

石化原料生产技术 冯文成等

课程章节

- 第一章石油及其产品的性质
 - 1.1 石油及其产品的组成和性质
 - 1.2 石油产品分类和石油产品的使用要求
- 原油评价与原油蒸馏
 - 2.1 原油的分类与原油的评价
 - 2.2 原油预处理
 - 2.3 石油及其馏分的气液平衡
 - 2.4 原油减压蒸馏工艺

课程评价: ★★★★★ 4.5 (1A/RP)

课程PV: 264413

化工工艺实训 冯文成等

课程章节

- 化工生产特点及化工生产装置组成
 - 1.1 化工生产特点
 - 1.2 化工生产装置组成
- 乙苯脱氢生产苯乙烯
 - 2.1 实训项目概述
 - 2.2 装置运行准备
 - 2.3 反应系统运行操作
 - 2.4 分离系统运行操作
 - 2.5 在线题库平台

课程评价: ★★★★★ 0.0 (1A/RP)

课程PV: 23775

高分子合成与加工综合实训

课程章节

- 高分子合成实训安全与防护
 - 1.1 高分子合成实训室安全规则
 - 1.2 高分子合成实训室安全防护
 - 1.3 高分子合成实训意外事故的紧急处理
 - 1.4 危险药品的使用与保管
 - 1.5 废弃物的处理
- 高分子合成实训基本技术
 - 2.1 高分子实训仪器

课程评价: ★★★★★ 5.0 (1A/RP)

课程PV: 758821