

11220CHEM576000 化學動力學 Chemical Kinetics

(Time: T3T4R2; Room: CHEM 325; Credits: 3)

****強烈建議大學部同學選修此門課程前已修習過大學部課程物理化學三**

Contents	Date
Introduction	2/20
Basic concepts of chemical kinetics (CH1&CH2): rate laws & Arrhenius equation	2/22, 2/27, 2/29
Complex reactions (CH2&CH2): analytic solution, approximation methods, Laplace transform, numerical methods	3/5, 3/7, 3/12
Kinetic measurements (CH3): apparatus and data analysis	3/14, 3/19, 3/21
Transport properties (CH4): mass transport, diffusion, and thermal transport	3/26, 3/28, 4/2
Reaction in condensed phase (CH4&CH5): cage effect, diffusion-controlled reactions, and conduction	4/11, 4/16, 4/18
Catalysis and heterogeneous reactions (CH5&CH6)	4/23, 4/25, 4/30
Macroscopic & microscopic level (CH6): cross section and rate coefficients	5/2
Potential energy surfaces (CH7): empirical and molecular bonding potentials, reaction pathways	5/7, 5/9, 5/16
Dynamics of molecular collisions (CH8&CH1): hard-sphere model, two-body-scattering, electronically nonadiabatic processes	5/21, 5/23, 5/28
Transition state theory, energy transfer and electron transfer (CH10+12&CH5), radiative relaxation, and quenching (others)	5/30, 6/4, 6/6, 6/11

停課日: 4/4 民族掃墓節/兒童節

考試日期: 4/9 (二)、5/14 (二)、6/18 (二), 10:00–13:30, 共 3.5 小時/次

授課教師: 朱立岡

上課方式: 板書+投影片

教科書:

Chemical Kinetics and Dynamics, 2nd Ed., J. I. Steinfeld, J. S. Francisco, W. L. Hase, Prentice-Hall, Inc., 1999.

Chemical Kinetics and Reaction Dynamics, P. L. Houston, 1st Ed., McGraw-Hill Intl. Ed., 2001.

參考書目(e-book, 可從清大圖書館獲得):

Chemical kinetics from molecular structure to chemical reactivity, 1st Ed., L. Arnaut, S. Formosinho, H. Burrows, Elsevier, 2006.

成績評量: 各 1/3, 總分 100 分