

## 無機化學二 (INORGANIC CHEMISTRY II)

(課號 203 34220)

學分：

三學分 (一學期, 大三下學期開課)

預修課程：

普通化學

開授對象：

化學系大三學生之基礎必修課。

課程內容：

授課時數

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一、離子鍵 (Ionic Bonding)：	6 h
離子固體與堆積(Ionic Solid and Packing)	
離子晶體之結構(Common Structure of Ionic Crystals)	
MX, MX <sub>2</sub> , M <sub>2</sub> X, perovskite, spinel 結構(MX, MX <sub>2</sub> , M <sub>2</sub> X, perovskite, spinel)	
晶格能(Lattice Energy)	
波爾公式, 波爾-罕博循迴, 凱布斯提基公式(Born Equation, Born-Haber cycle, Kapustinkii Equation)	
二、固態化學(Solid State Chemistry)：	12 h
晶格結構(Crystal structure)	
晶格, 單位晶格, 米勒指數, 倒晶格(lattice, unit cell, Miller indices, reciprocal lattice)	
缺陷結構(Defect Structure)	
史特基與伏蘭克缺陷, 非化學計量之化合物(Schottky and Frenkel Defects, nonstoichiometric compounds)	
金屬, 絕緣體與半導體(Metals, Insulators and Semiconductors)	
價帶, 導電帶, 鑲嵌, n-型, p-型(Valence band, conduction band, dopant, n-type, p-type)	
超導體(Superconductivity)	
性質, 結構, 製程(Properties, structure, processing)	
矽氧化物之結構, 椅狀, 環狀, 簇狀與籠狀結構(Structures of Silicates, Chains, Rings, Cluster and Cage Compounds)	
三、配位化合物(Coordination Compounds)：	12 h
配位化合物的結構(Structure of coordination compounds)	
配位數 2, 3, 4, 5, 6, >6(Coordination number 2,3,4,5,6, >6)	
配位基種類, 鉗合效應(Types of ligands, chelate effect)	
異構物: 幾何, 光學, 游離, 連結, 配位等(Isomerism: geometrical, optical, ionization, linkage, coordination, etc.)	
命名(Nomenclature)	
反應機制(Reaction mechanism)	
取代, 電子傳遞反應(Substitution, Electron transfer reactions)	
鍵結, 光譜, 磁效應(Bonding, Spectra, Magnetism)	
價鍵理論(Valence Bond theory)	

晶場理論(Crystal Field Theory)	
分子軌域理論(Molecular Orbital Theory)	
電子光譜, 磁性質(Electronic spectra, magnetic properties)	
<b>四、有機金屬&amp;生物無機分子(Organometallic &amp; Bioinorganic Chemistry) :</b>	<b>6 h</b>
非過渡元素之有機金屬化合物(Non-transition metal organometallics)	
過渡元素之有機金屬化合物(Transition metal organometallics)	
鍵結與光譜(Bonding and Spectroscopy)	
配位基(Ligands)	
反應機制(Reaction mechanisms)	
氧化加成與還原去除反應(Oxidative addition and reductive elimination)	
遷移(嵌入)與去嵌入(Migration (insertion) and de-insertion)	
催化反應(Catalytic reactions)	
生物無機(Bioinorganic)	
金屬與氮化反應簡介(Brief introduction on Metalloenzymes, Nitrogen fixation)	
氧傳遞, 光合作用與電解之生物效應(Oxygen transfer, Photosynthesis and Bio-function of electrolytes)	
<b>五、敘述性化學(Descriptive Chemistry) :</b>	<b>8 h</b>
氫與其化合物(Hydrogen and Compounds)	
金屬氫化合物(Metallic Hydrides)	
氫氣儲存(Hydrogen Storage)	
s- & p-族元素(s- & p-Block Elements)	
鹼金屬與鹼土金屬(Alkali and Alkali Earth Metals)	
氮與磷(Nitrogen and Phosphorus)	
氧, 硫與硒(Oxygen, Sulfur and Selenium)	
鹵素(The Halogens)	
惰性氣體(The Nobel Gases)	
d-族元素(d-Block Elements)	
電子結構, 氧化態與電動勢(Electron Configuration, Oxidation States and EMF)	
配位化合物與有機金屬化合物(Coordination Compound and Organometallic Compounds)	
f-族元素(f-Block Elements)	
鐳系與錒系元素(The Lanthanide and Actinide)	
電子結構, 氧化態(Electron Configuration and Oxidation States)	
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	合計 <b>44 h</b>