

開課系所： 化學研究所(必修)  
課程名稱： 高等無機化學（專論）一(3學分)  
(Discussion in)Advanced Inorganic Chemistry (I)  
課程編號： 223 M1410 / 223 D1410  
授課對象： 化學研究所碩博士班

方向

**Scope**

Bonding, Structure, Reactivity, Mechanism, and Applications of Inorganic Compounds

大綱

**Outline**

**I. Symmetry & Bonding**

- Molecular Geometry
- Symmetry Elements & Operations, Point Groups, Representation & Character Tables, Applications to Spectroscopies
- Symmetry-adapted Linear Combination
- Molecular Orbital Theory
- Walsh Diagram

**II. Coordination Chemistry**

- Transition Metal Elements
- Electronic Configuration
- Structures & Bonding
- Spectroscopy & Magnetism
- Orgel diagram, Tanabe-Sugano Diagram

**III. Optional Topics**

- Reactivity & Reaction Mechanisms
- Main Group Chemistry
- Supramolecular Chemistry
- Organometallic Chemistry
- Bioinorganic Chemistry
- Acid-Base Concept
- Solid State Systems

教材及參考書

**Texts & References**

1. F. Albert Cotton; "Chemical Applications of Group theory"; Wiley-Interscience; 1990; 3rd Edition.
2. James E. Huheey, Ellen A. Keiter, Richard L. Keiter; "Inorganic Chemistry: Principles of Structure and Reactivity"; Benjamin Cummings; 1997; 4th Edition.
3. F. Albert Cotton, Geoffrey Wilkinson, Carlos A. Murillo, Manfred Bochmann, Russel . Grimes; "Advanced Inorganic Chemistry"; Wiley-Interscience; 1999; 6th Edition.
4. Gary L. Miessler, Donald A. Tarr, "Inorganic Chemistry", Pearson, Prentice Hall, 2004, 3rd Edition.
5. B.E. Douglas and C.A. Hollingsworth, "Symmetry in Bonding and spectra".
6. R.S. Drago, "Physical Methods for Chemists".
7. K.F. Purcell and J.C. Kotz, "Inorganic Chemistry"
8. D.F. Shriver, P.W. Atkins and C.H. Langford, "Inorganic Chemistry"
9. A. R. West, "Basic Solid State Chemistry".
10. Y. Wang, "Ligand Field Concept" Encyclopedia of Physical Science and Technology" 3<sup>rd</sup> Ed. Vol. 8, P.523-538.

先修科目

**Pre-requisites**

General Chemistry is essential, and undergraduate Inorganic Chemistry and Quantum Chemistry are recommended.

上課方式

**Means of Conducting the Course**

Lectures and Discussion

Assignments, Homework, Term Paper and/or Presentation

成績評量

**Grading**

In addition to two examinations (Midterm and Final), Ph.D. students need to turn in Final written reports on a special topic concerning a series of researches on Inorganic Chemistry