

CHEM480: Solid State Chemistry

Instructor: Prof. C. S. Yoo (509) 335-2712; csyoo@wsu.edu

Class Schedule: MWF 11:10 – 12:00 at F225

Description:

This class is designed for upper-level undergraduate and graduate students in chemistry, material science and physics. The class will cover fundamental principles of physics and chemistry in solids, explore crystal structure-properties relationships, and discuss about the applications to real world problems such as lasers, semiconductors, multi-functional materials, and energy generation and storage. The relationships among chemical bonding and crystal structure will be emphasized, as well as the experimental methods commonly used to study solids such as synchrotron x-ray diffraction and other spectroscopic methods.

Topics to be covered:

- Crystal Structures
- Bonding in Solids
- Crystallography and Diffraction Techniques
- Other Preparative Methods: Synchrotron X-rays, Laser Spectroscopies, Thermal Analysis
- Crystal Defects
- Phase Diagrams and Polymorphism
- Electric Properties
- Magnetic Properties
- Optical Properties
- Solid State Reactions and Synthesis

Text and References:

- R. West, Solid State Chemistry and its Applications, 2nd editions; Student Edition
- L. E. Smart and E. A. Moore, Solid State Chemistry: An Introduction, 3rd edition
- P. A. Cox, The Electronic Structure and Chemistry of Solids