

Physical Methods in Chemistry and Nano Science

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Andrew R. Barron

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Introduction¹

Course Introduction

Chem 475 is a survey course of research techniques used in modern chemistry, materials science, and nano science. The topics are grouped, not by method *per se*, but with regard to the type of information that can be obtained. Thus, the topics are ordered as follows:

- Elemental composition.
- Physical and thermal analysis.
- Chemical speciation.
- Dynamic processes.
- Reaction kinetics and pathways.
- Molecular structure.
- Structure at the nano scale.
- Surface morphology and structure.
- Optical properties.
- Device performance.

As a consequence of this organization methods can be found in different chapters. For example, X-ray photoelectron spectroscopy is included under *elemental composition* with regard to its use for determining the chemical composition, while it is included under *chemical speciation* with regard to determining the identity of component chemical moieties.

The modules in this course (to date) have been developed by the students in the class and the topics are representative of their research interests. As the course develops, further modules will be added and consequently some may overlap in subject matter.

¹This content is available online at <<http://cnx.org/content/m23040/1.9/>>.

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