Advanced Materials Characterization Techniques

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# OVERVIEW

Principles and operation of most useful advanced materials characterization techniques in modern research, including surface spectroscopy, diffraction, electron microscopy, mass spectroscopy and etc.

# Course Outline

* Introduction
* Surface spectroscopy
* Diffraction
* Electron Microscopy
* Mass spectroscopy
* Other techniques

# Reference Books

* P. E. F. Flewitt and R. K. Wild, Physical Methods for Materials Characterization, Institute of Physics (IOP) Publishing Ltd., 2nd ed. 2003
* C. R. Brundle, C. A. Evans Jr., and S. Wilson, Encyclopaedia of Materials Characterization, Butterworth-Heinemann & Manning Publications Co., 1992
* J. C. Riviere, Surface Analytical Techniques, Clarendon Press, Oxford, 1990
* D. A. Skoog,, F. J. Holler, and T. A. Nieman, Principles of Instrumental Analysis, 5th ed.,Saunders College Publishing, 5th ed. 1998
* B. D. Cullity, Element of X-ray Diffraction, 2nd ed., Addison-Wiley Publisher, 1978
* P. B. Hirsch, H. Howie, R. B. Nicholson, D. W. Pashley, and M. J. Whelan, Electron Microscopy of Thin Crystals, Butterworths, 1965
* H. E. Duckworth, R.C. Barbar, and V.S.Venkatasubramanian, Mass Spectroscopy, 2nd ed. Cambridge University Press, 1986
* C. N. Banwell, E. M. McCash. Fundamentals of Molecular Spectroscopy, 4th ed. London, New York : McGraw-Hill, 1994
* W. Czanderna, T. E. Madey, and C. J. Powell, Beam effects, surface topography and depth profiling in surface analysis, Kluwer Academic, New York, 2002