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Surface Characterization Techniques in Materials Research and Development

Materials characterization allows for a better understanding of the relationships among the processing, structure, properties and performance of advanced materials and is vital in industrial research and development. Modern industries rely on several surface analysis techniques, including scanning electron microscopy (SEM), energy-dispersive x-ray spectroscopy (EDS), x-ray photoelectron spectroscopy (XPS), and x-ray diffraction (XRD). Each surface analysis technique has unique functionalities, capabilities, advantages and limitations. In this presentation, the function and operation of SEM/EDS, XPS, and XRD will be discussed alongside examples of their use in high-tech materials research and development.

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