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A review of synchrotron X-ray radiation spectroscopy and imaging

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Abstract

Synchrotron radiation is an advanced polarized and collimated light source with high brilliance and intensity. This radiation has a wavelength range from infrared to the highest-energy X-rays. In this article, we provide a summary of application of X-ray spectroscopy with synchrotron radiation. Here we discuss various types of X-ray techniques include X-ray powder diffraction (XRPD), wide angle X-ray scattering (WAXS), small-angle X-ray scattering (SAXS), X-ray fluorescence (XRF), X-ray reflectometry (XRR), near edge X-ray absorption fine structure (NEXAFS), X-ray absorption near edge structure (XANES), photo electron spectroscopy (XPS), X-ray emission spectroscopy (XES), and X-ray imaging spectroscopy. These techniques provide good potential for characterization of various micro- and nano-materials. Furthermore, some advantages of the use of these techniques are as follows: improving signal to noise ratio, better spatial resolution, and improving data acquisition.

Keywords: synchrotron radiation, X-ray spectroscopy, X-ray imaging

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