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The present and future of neutron scattering for the characterisation of key functional materials

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Properties and functions of materials are determined by the structure and its evolution on every relevant time, length, field and energy scale. To understand these, neutrons play a critical role in providing important insights into the structure of polar functional materials as it responds to stimuli. In this talk, I will present a summary of recent progress in neutron scattering studies of piezoelectric, anti/ferroelectric and multiferroic materials, with a special focus on the investigation of neutron diffraction conducted under different fields (e.g. temperature, magnetic/electrical field and pressure). I will also report structurally dynamic behaviours of zeolites and metal-organic frameworks (MOFs) investigated by using time-of-flight inelastic neutron scattering and comment on the role neutrons play in gaining new insights into the properties of a broad range of key materials for practical application. I will then discuss overcoming challenges and technical difficulties to attain precision neutron analyses, and give my personal perspective as a user on the continuous development of instruments and methods needed for neutron scattering studies in the future.

Topic

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