

Neutron scattering study on materials with colossal barocaloric effects

Friday, 13 November 2020 11:00 (30 minutes)

Caloric materials are systems that exhibit significant thermal effects at phase transitions induced by external fields like temperature, pressure, stress, magnetic fields, and so forth. They can be used for the solid-state refrigeration through a designated cooling cycle. The core physical issue of caloric materials is the evolutions of atomic structures and interactions as a function of these driving forces in multiple spatial and temporal scales. State-of-the-art characterization techniques based on large-scale facilities such as neutron scattering are highly desirable in this case due to the powerful experimental abilities and versatile sample environments. In this presentation, I will report several case studies of colossal barocaloric effects using neutron scattering techniques. Pressure-dependent neutron scattering measurements on the prototype neopentylglycol as well as other novel systems reveal that colossal barocaloric effects can be attributed to the interplay between extensive orientational disorder and anharmonic lattice dynamics of materials.

Level of Expertise

Experienced Research

Speakers Gender

Male

Do you wish to take part in the poster slam

No

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