

Abstract Submitted
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Angular rheology study of colloidal nanocrystals using Coherent X-ray Diffraction MENGNING LIANG, University of Illinois Urbana-Champaign, ROSS HARDER, IAN ROBINSON, University College London — A new method using coherent x-ray diffraction provides a way to investigate the rotational motion of a colloidal suspension of crystals in real time. Coherent x-ray diffraction uses the long coherence lengths of synchrotron sources to illuminate a nanoscale particle coherently over its spatial dimensions. The penetration of high energy x-rays into various media allows for in-situ measurements making it ideal for suspensions. This technique has been used to image the structure of nanocrystals for some time but also has the capability of providing information about the orientation and dynamics of crystals. The particles are imaged in a specific diffraction condition allowing us to determine their orientation and observe how they rotate in real time with exceptional resolution. Such sensitivity allows for the study of rotational Brownian motion of nanocrystals in various suspensions and conditions. We present a study of the angular rheology of alumina and TiO₂ colloidal nanocrystals in media using coherent x-ray diffraction.

Mengning Liang
University of Illinois Urbana-Champaign

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