Nuclear resonant inelastic x-ray scattering from ^{83}Kr

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Abstract

We have extended the technique of nuclear resonant inelastic x-ray scattering to the 9.4035-keV nuclear transition of ^{83}Kr at 3-ID beamline of the Advanced Photon Source. A 4-bounce, "in-line", high energy-resolution monochromator with energy resolution of 1-meV has been developed using Si (8 0 0) reflections. This is combined with a microfocusing K-B optics for the experiments at high pressure using diamond anvil cell technique. Phonon density of states of ^{83}Kr has been measured on solid Kr under high pressures up to 46 GPa. Furthermore, vibrational properties of Kr-clathrate at low temperatures and under high pressures have been studied by nuclear resonant inelastic scattering and molecular-dynamics simulations. Results will be discussed during the presentation.

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