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Phonon-scintillation properties of molybdate crystals for neutrino-less double beta decay experiment

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The AMoRE (Advanced Mo based Rare process Experiment) double beta project currently uses CaMoO4 crystals as the particle absorber of the low temperature phonon-scintillation detectors to search for neutrinoless double beta decay of 100Mo. However, an R&D of other molybdate crystals is in progress aiming to find higher performance molybdate crystal satisfying the AMoRE experiment requirements. We studied phonon-scintillation properties of several molybdate crystals (Na2Mo2O7, Li2MoO4). Simultaneous measurements of heat (phonon) and scintillation (photon) signals were carried out at milli-Kelvin temperatures using 1 x 1 x 1 cm3 crystal samples. The detector performances of each crystal are compared in terms of energy resolution, light yield, and particle discrimination capability using light/heat ratio and pulse shape of phonon signals.

Has accepted

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