

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 CaMoO_4 crystals as the particle absorber of the low temperature phonon-scintillation detectors to search for neutrinoless double beta decay of ^{100}Mo . 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 ($\text{Na}_2\text{Mo}_2\text{O}_7$, Li_2MoO_4). Simultaneous measurements of heat (phonon) and scintillation (photon) signals were carried out at milli-Kelvin temperatures using $1 \times 1 \times 1 \text{ cm}^3$ 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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