

Production of low background scintillating crystals for underground experiments in Korea

There are two major underground experiments in Korea, AMoRE and COSINE, searching for neutrinoless double beta decay and WIMP (Weakly Interacting Massive Particle) type dark matter respectively. The Advanced Molybdenum based Rare process Experiment (AMoRE) is searching for the neutrinoless double beta decay of ^{100}Mo isotopes in molybdate crystals using high-resolution cryogenic detectors in milli-kelvin temperatures. Various molybdate crystals such as $^{48}\text{depCa}^{100}\text{MoO}_4$, $\text{Li}_2^{100}\text{MoO}_4$, $\text{Na}_2\text{Mo}_2\text{O}_7$, and PbMoO_4 for the AMoRE phase-II with ~ 100 kg of ^{100}Mo are being grown and tested. For the COSINE experiment, a mass-volume NaI(Tl) crystal growth are currently under development at the Center for Underground Physics (CUP) of Institute for Basic Science (IBS) in Korea. Both experiments require quite challenging low background levels in the crystals being developed. A review on the production of the crystals is going to be presented.

Author: Dr LEE, Moo Hyun (Institute for Basic Science (IBS))

Co-authors: Dr KIM, Yeongduk (Sejong University); Prof. KIM, Hong Joo (Kyungpook National University); Dr KIM, Yong-Hamb (IBS); Dr LEE, Hyunsu (IBS); Dr SHLEGEL, Vladimir (Nikolaev Institute for Inorganic Chemistry (NIIC)); Dr PARK, Hyang Kyu (Korea University); Dr LEONARD, Douglas (IBS); Dr GILEVA, Olga (IBS); Mr RA, Sejin (IBS)

Presenter: Dr LEE, Moo Hyun (Institute for Basic Science (IBS))