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Developments of materials purification to produce calcium molybdate crystal for the AMoRE (12' + 3')

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The AMoRE (Advanced Mo-based Rare process Experiment) is aiming at search for the neutrinoless double-beta decay of ^{100}Mo with ^{100}Mo -enriched and ^{48}Ca -depleted calcium molybdate (CMO) crystals with the chemical formula, $^{48}\text{deplCa}^{100}\text{MoO}_4$. The final goal of the experiment is to explore the entire effective Majoran neutrino mass range that is allowed by the inverse mass hierarchy. To achieve such an ambitious goal, ultra-pure crystals with concentration of thorium and radium ~ 100 times lower than that in the currently available CMO crystals are required. The collaboration has developed purification methods for raw materials, CaCo_3 and MoO_3 powders, to grow the crystal and crystal-growing technique. In this poster, we will present purification results for various methods such as sublimation, column chromatography, sedimentation and co-precipitation for powders and developed crystals. Future prospects of radiopure CMO crystal scintillators production will be discussed.

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