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Study of Cs_2MCl_6 (M = Hf or Zr) crystal scintillators in the search for rare processes in Hf and Zr isotopes

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Recently there has been considerable interest in the development of crystal scintillators of the Cs_2MCl_6 family of metal hexachlorides (M = Hf or Zr) due to their exceptional properties: a high light yield (up to 35000 photons/ MeV), good linearity in the energy response, excellent energy resolution ($< 3.5\%$ at 662 keV in the best configuration) and excellent ability to discriminate the pulse shape (PSD) between $\gamma(\beta)$ and α particles. In particular, an experiment was performed using three Cs_2ZrCl_6 (CZC) crystals and one Cs_2HfCl_6 (CHC) crystal scintillator in optimized geometry. Low-background measurements have been carried out deep underground at the DAMA/CRYS setup of LNGS. The crystal growth technique, raw material purification, and post-growth material treatment are discussed. Moreover, the three CZC crystals were grown using starting materials with different purities to study their resulting characteristics and were encapsulated using a silicone-based sealant. Result on the α decay to the ground state of ^{174}Hf is also presented here together with the future perspectives of these measurements.

Internet talk

Maybe

Is this an abstract from experimental collaboration?

Yes

Name of experiment and experimental site

DAMA/CRYS, LNGS

Is the speaker for that presentation defined?

Yes

Details

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Session Classification: Session on other topics and interdisciplinary topics

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