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Measurement of Thorium in NaCl

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We have performed a mesurement of the theorium content of a "Puratronic" grade NaCl sample produced by Johnson Matthey Co. 262 mg of the NaCl were encapsulated in a quartz tube and were irradiated for 65 hours in a flux of  $1 \times 10^{14}$  thermal neutrons/cm<sup>2</sup>-sec at the University of Missouri Research Reactor Facility. The flux was determined by simultaneously irradiating a 3-mg chip of metallic iron and subsequently measuring the induced <sup>59</sup>Fe activity. After allowing one month for the initial 4 Curies of <sup>24</sup>Na present in the NaCl sample to decay away, the sample was counted at LBL using a 110 cm<sup>3</sup> high-purity Ge detector. A search was made for the strong 312-keV line emitted following the beta decay of <sup>233</sup>Pa. No peak was observed at the expected position and a limit of < 4 x 10<sup>-10</sup> g/g was established for the Th concentration in this salt. Because of the necessarily long cooling time, we were not able to set any meaningful limit on the possible uranium content of this sample.

We also counted the irradiated quarts tube and did observe the 312 keV line (along with a couple of the other known lines). We determined that the Th concentration in this sample of quartz manufactured by Quartz Products Co. was  $1.7 \times 10^{-8}$  g/g.