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Irradiated quartz for beta source calibration

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For luminescence dating to be an accurate absolute dating technique it is very important that we are able to deliver absolutely known radiation doses in the laboratory. This is normally done using a beta source calibrated against an absolutely known reference source or by using a reference luminescence material that has been irradiated in a radiation calibration facility. Here we describe in detail the preparation and luminescence characteristics of a new quartz reference material of the luminescence dating laboratory at CEADEN. A selected sample of quartz extracted from a query in Pinar del Rio province has been treated to extract high pure quartz grains with diameters ranging from 180 to 250 μm. The resulting material was further treated to sensitize and stabilize the luminescence signal prior being irradiated to 5.0±0.3 Gy at the secondary calibration gamma source (related to BIPM) at the CPHR. With this material the dose rate of beta source of the automated luminescence reader LF02 has been calculated to be 0.034±0.002 Gy/s.

Authors: CEPERO, T. (Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear (CEADEN), Cuba.); BALY, L. (Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear (CEADEN), Cuba.); QUESADA, I. (Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear (CEADEN), Cuba.); GUTIERRE, S. (Centro de Higiene y Protección de las Radiaciones (CPHR), Cuba.)

Presenter: CEPERO, T. (Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear (CEADEN), Cuba.)

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