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Radiation Fields, Effects and Risks in Human Space Missions (4)

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LUMINESCENCE PROPERTIES OF DEAD SEA CRYSTALS FOR SPACE DOSIMETRY

Abstract

The Dead Sea is a giant, super-saline lake at the lowest spot on Earth. And its beaches appear to be pebbled with perfect little cubes of sodium chloride. The Dead Sea Crystal (NaCl) were tested under beta low doses (17-750 mGy) from ^{90}Sr at UNAM. The aim of this paper is to analyze the thermoluminescence (TL) response of the NaCl crystals under irradiation at room temperature. The results from experiments relevant to space dosimetry applications, such as signal resetting, dose response and thermal stability, are described. The behaviour of the TL signal observed was found to be favourable for monitoring low doses on the crew present at spaceship, with both the thermal stability and dose response suggesting a range of at least 500 mGy. In turn the samples show an abroad glow curves and high TL intensity. The maximum temperature of the glow peaks were observed at 220 C In this last case, a linear TL response between 17-750 mGy was observed. The dead sea crystals should be useful to use as natural passive detector also in order to prevent and monitoring the radiation damage in the environment radiation conditions of the spacecraft.