

OSL TECHNIQUE FOR STUDIES OF JASPER SAMPLES

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Jasper samples (green, red, brown, ocean and stripped) were studied in relation to their optically stimulated luminescence (OSL) dosimetric properties, in this work. Since 2000, the radiation metrology group of IPEN has studied different stones as new materials for application in high-dose dosimetry. Jasper is included in the Chalcedony group. The fine-grained jasper always contains strange materials, sometimes even in a proportion of 20%. These impurities determine its color tone, the risk or the design of the jasper samples, but in general such materials may be sub-divided into chalcedony (sometimes called jasper) and agate. Jasper color is fairly uniform (green, red, brown, ocean and stripped), and agate color is arranged in bands or in concentric zones. The jasper samples were exposed to different radiation doses, using the gamma-cell 220 system (⁶⁰Co) of IPEN. Calibration curves were obtained for the jasper samples between 50 Gy and 300 kGy. The reproducibility of the OSL response and the lower detection doses were determined. All five types of jasper samples showed their usefulness as irradiation indicators and as high-dose dosimeters, using the OSL technique.