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EPR Dosimetric Potential of Ammonium Oxalate Monohydrate in Radiation Technology

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This study aims to examine the dosimetric properties of the ammonium oxalate monohydrate ($(\text{COONH}_4)_2\text{H}_2\text{O}$) under low and high radiation doses. The EPR spectra of ammonium oxalate have the spectroscopic splitting g -factors of 2.0095 and 2.0047. Results indicate that the dose-response curves have a good linearity in the range between 10-1000 Gy for low doses. Slight sub-linearity has been found in high dose region up to 25 kGy. The effects of temperature and humidity on the EPR signal amplitude of the irradiated samples are studied. Stability of the irradiation rods upon storage (signal fading) was also investigated. Energy dependence has been found within 38% at the range below 100 keV. Slightly energy dependence within 4% over the energy range 6 –10 MeV has been recorded. The overall uncertainty of this dosimetry system is 4.64% (σ_2) in low dose range and 3.67 % for the high dose range.

Country/Organization invited to participate

Sudan

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