Preparation of CaSO4:Dy by precipitation method to gamma

radiation dosimetry

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a b s t r a c t

This paper presents the results of the preparation and characterization of dysprosium-doped calcium sulfate

(CaSO4:Dy) phosphor, which was obtained by homogeneous precipitation from calcium acetate

Ca(CH3COO\_)2. Structural and morphological characteristics were studied using a scanning electronic

microscope (SEM). The structure of all compounds was determined by X-ray diffraction method too.

Thermoluminescence (TL) emission properties of CaSO4:Dy under gamma radiation effects were studied. This

phosphor powder presented a TL glow curve with two peaks (Tmax) centered at around of 180 and 300 1C,

respectively. The TL response of CaSO4:Dy as a function of gamma absorbed dose was linear in a wide range.

Both emission and excitation spectrawere also obtained. Results showed that this new preparation method of

CaSO4:Dy TL phosphor is less expensive, cleaner and safer than the conventional preparation method.