

## Radiation Dosimetry Using Sintered Pellets of Yellow Beryl (Heliodor) Crystals

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**Abstract :** Beryl is a silicate with chemical formula  $\text{Be}_3\text{Al}_2(\text{SiO}_3)_6$  commonly found in Brazil. It has a few colored variations used as jewelry, like Aquamarine (blueish), Emerald (green) and Heliodor (yellow). The color of each variation depends on the dopant that is naturally present in the crystal lattice. In this work, Heliodor pellets of 5 mm diameter and 1 mm thickness have been produced and investigated using thermoluminescence (TL) to evaluate its potential for use as gamma ray's dosimeter. The results show that the pellets exhibited a prominent TL peak at 205 °C that grows linearly with dose when irradiated from 1 Gy to 1000 Gy. A comparison has been made between powdered and sintered dosimeters. The results show that sintered pellets have higher sensitivity than powder dosimeter. The TL response of this mineral is satisfactory for radiation dosimetry applications in the studied dose range.

**Keywords :** dosimetry, beryl, gamma rays, sintered pellets, new material

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