

## TL reproducibility of HPHT diamond enhanced by $\gamma$ irradiation and thermal annealing

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The HPHT diamond is known for non TL reproducibility behavior, this issue it prevents for the radiation detection application and dose measurement.

In this work, we present experimental TL data after two cycles consisting of high dose gamma irradiation 500 kGy followed by thermal annealing at 800°C for 1 hour under N<sub>2</sub> atmosphere. We found that in each cycle the reproducibility and sensitivity of TL were improved. The samples showed a 4 TL peaks center at 360K, 408 K, 524K and 618K with activation energies of 0.6 eV, 1 eV, 1.1 eV and 1.3 eV, respectively. This was confirmed by McKeever, and initial rise method. These preliminary results suggest that there is replenishment of traps then it generates a homogenous TL response.