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Behavior under γ ; irradiation of single crystals of NaCl doped with divalent cations

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In this work, is analyzed the interactions of the gamma;-radiation with two alkali halide single crystals: NaCl doped with Ca^{2+} (0.3 %) or Mn^{2+} (0.3 %), at two irradiation temperatures (298 K and 77 K), and different doses at a fix dose rate, for their possible use as dosimeters. The irradiated crystals were analyzed using their thermoluminescence properties. The application of the thermoluminescence (TL) phenomenon has been proved to be a very efficient method to evaluate energy deposited by gamma; radiation on irradiated samples.

The productions of irradiation defects in the solid were correlated with the glow curve. F-centers were measured as function of the dose. The bleaching of the F-centers produced a decrease of the peak of the glow curve. The bleaching of the color centers associated with the reduction of the glow curve suggests that F centers are intimately involved in the production of the thermoluminescence phenomenon. Their exact role can not be centered and much discussion has still to be done. Nevertheless, these behaviors suggest that the glow peaks very probable are result from the thermal release of holes from different kinds of traps, recombining at F centers. The preliminary results show that the linear response obtained was fairly good for the system NaCl: Cd, at low irradiation doses.

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