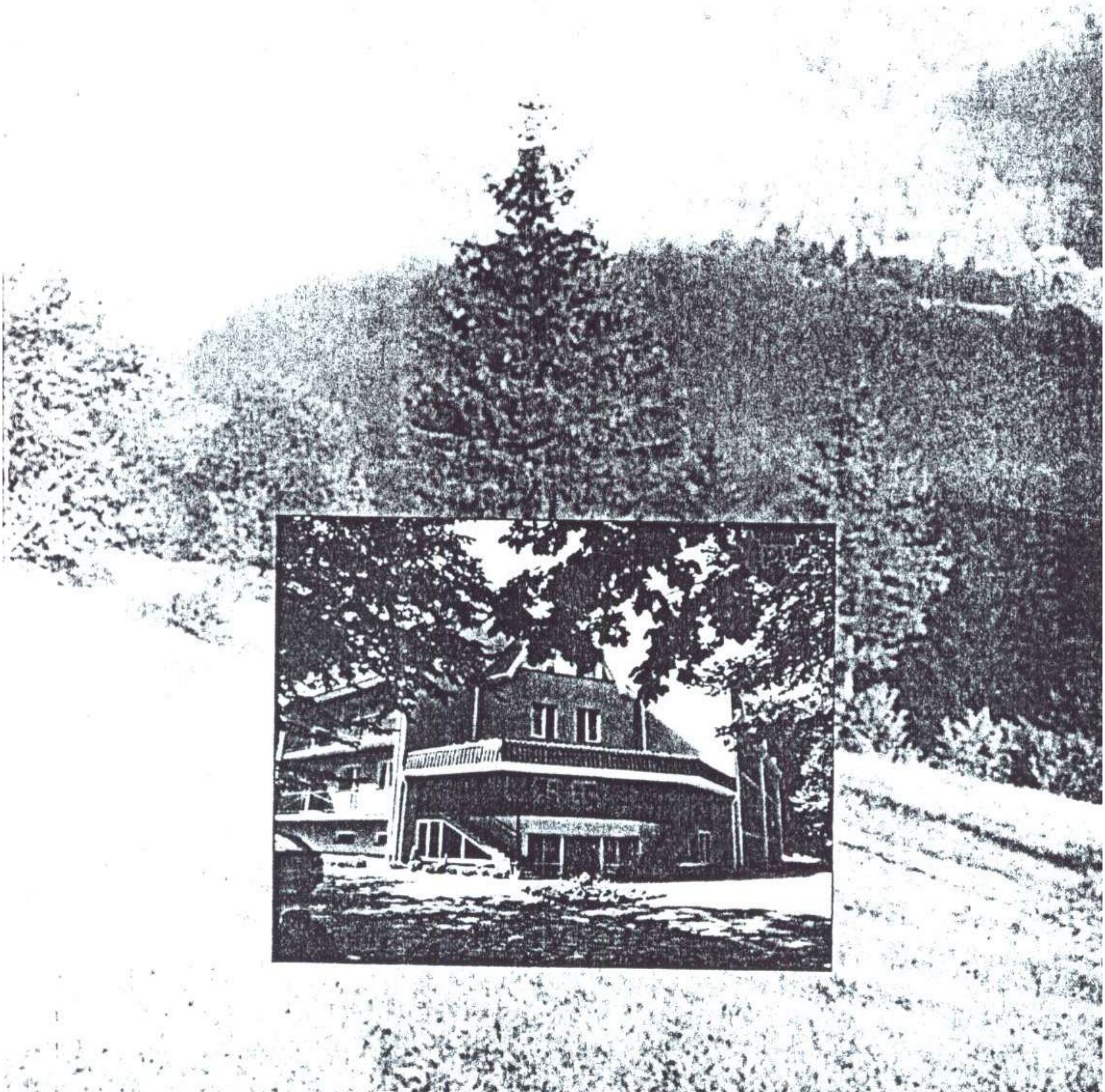
International Meeting

CLUSTERS AND NANOSTRUCTURED MATERIALS (CNM-3)



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P3-17. INFLUENCE OF PbI_2 NANOCRYSTAL INCLUSIONS CONCENTRATION ON THE TRAPPING CENTER DISTRIBUTION DENSITY IN THE LAYERED CRYSTAL SYSTEM

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Isomorphic layered compounds of CdI_2 and PbI_2 with similar lattice parameters exhibit different types of stable crystallographic packing: 4H and 2H, respectively. As we reported earlier, in the crystals grown by the Stockbarger method the PbI_2 impurity is incorporated into the CdI_2 crystal lattice in its 4H-modification, starting with the minimal concentrations [1].

In the present work we have studied the crystals grown from both the melt and the saturated water solution. We investigated the trapping centers in CdI_2 crystals, containing from 10^{-4} to 5 mol.% of PbI_2 impurity in the temperature range 80-300 K by thermally stimulated depolarization method. It was established that particularly favourable conditions for stable photoelectret state formation are created in the CdI_2 crystals with a minimum of PbI_2 impurity content ($< 10^{-4}$ mol.%). Influence of the crystal growth method on the trapping center structure was examined.

Thermally stimulated depolarization spectra were analyzed with the use of the computational procedure of non-correct integral equation solving, which allowed to determine the energy distribution function of the trapping centers [2]. Comparison of distribution densities for CdI_2 crystals with different PbI_2 content brought us to the conclusion that the growing impurity concentration leads to the increase in the number of Pb^+ electron trapping centers, typical for 4H-orientation. Further growth of concentration results in the enlarged contribution of deep traps related to the presence of phase inclusions of PbI_2 impurity.

[1] I. M. Bolesta, V. V. Vistovskii, N. V. Gloskovskaya, M. R. Panasyuk, and L. I. Yaritskaya. Physics of the Solid State, **53**, *4*, 799, (2011).
[2] A. V. Gal'chinskii, N. V. Gloskovskaya, and L. I. Yaritskaya. Inorganic Materials, **48**, *4*, 423, (2012).