

METALLIC CLUSTERS IN CdI_2
CRYSTALS: ELECTRON MICROSCOPY
STUDY AND COMPUTER-BASED ANALYSIS
OF THEIR NUMERICAL CHARACTERISTICS

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S u m m a r y

Metallic clusters of cadmium have been revealed in CdI_2 crystals grown from a melt or a gas phase by means of the scanning electron microscopy (SEM) technique. It is shown that, in the former case, the clusters are formed when a composition deviates from the stoichiometric one towards a cadmium content growth. In the latter case, the metallic clusters form fractal structures, whose fractal dimension is $D \approx 1.73$, on the surface of crystals. The algorithms to analyze the cluster structures on the basis of their images are proposed and implemented. This makes it possible to calculate the radii of clusters, intercluster distances, and distribution functions for these parameters. It is demonstrated that there exists a difference in numerical parameters between the clusters formed in crystals grown by different techniques, which points to the differences in the cluster formation mechanisms. The formation of cluster structures on the surface of the crystals grown from a gas phase is simulated in the frame of a diffusion-limited aggregation model. It is concluded that these structures are formed by the particle-cluster mechanism, with the growth centers being inhomogeneous regions of the surface of a crystal.