

## Defect structure of CdTe-based single-crystals for X-ray and gamma radiation detection purposes

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Single-crystals based on CdMnTe are known and studied in the context of potential applications as materials for room-temperature detectors of electromagnetic radiation - gamma and X [1-3]. The characteristics that predispose these materials to such applications are good carrier-transport properties, wide band gap and high resistivity [1]. However, the detector's performance depends on the structural quality of the crystals applied; for example, Te inclusions can strongly influence it [1]. Therefore, the structural characterization of these materials is an important task. Defect structure of Bridgman-grown (Cd,Mn)Te and (Cd,Mn)(Te,Se) single-crystals [4, 5] were studied applying laboratory X-ray diffraction technique based on CuK $\alpha$  radiation. X-ray diffraction (XRD) patterns were recorded to obtain information about the general quality of the samples. Defect spatial distribution was investigated by determination of the lattice constant maps and  $\omega$ -scan maps. The results exhibit a presence of micromosaics in the both characterized samples and misoriented crystal blocks in the (Cd,Mn)(Te,Se) one. The lattice constant distribution is characterized by high homogeneity in the both materials (the observed changes are at the ppm level). Based on XRD studies compared with the results of other investigations, reported in [5], it can be concluded that the Bridgman-grown (Cd,Mn)Te crystals are more promising materials for X-ray and gamma radiation detectors than (Cd,Mn)(Te,Se) due to the better crystal structure.

### References

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