

Study of metal contacts on $\text{Cd}_{1-x}\text{Zn}_x\text{Te}$ and $\text{Cd}_{1-x}\text{Mn}_x\text{Te}$ crystals for radiation detector applications

This work describes a comprehensive study of metal contacts on single crystals of II-VI group semiconductors, $\text{Cd}_{1-x}\text{Zn}_x\text{Te}$ and $\text{Cd}_{1-x}\text{Mn}_x\text{Te}$. Both materials are candidates for numerous detector applications, while the former is more established, the latter has potential advantages. In this work we formed metal contacts on high resistivity Bridgman grown $\text{Cd}_{1-x}\text{Zn}_x\text{Te}$ and $\text{Cd}_{1-x}\text{Mn}_x\text{Te}$ crystals by thermal evaporation method. Usage of different contact materials and various surface preparation processes of the Me-Semiconductor interface allowed a comprehensive comparison of the resulting performance of obtained devices. The characterization of the detectors included varied techniques such: I-V measurements, noise PSD (Power Spectral Density), determination of the activation energy (temperature behavior), etc. The results of comparison reveal the advantages and drawbacks of produced detectors. This work emphasizes the pronounced potential of $\text{Cd}_{1-x}\text{Mn}_x\text{Te}$ crystals for radiation detectors.

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Session Classification: Poster Session A

Track Classification: Semiconductor Detectors