

Hg_{1-x}Cd_xI₂/CdTe-based heterostructures as a new high Z material for radiation detectors

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Hg_{1-x}Cd_xI₂ and CdTe belong to the high Z, wide bandgap semiconductor compounds of the type II-VII₂ and II-VI, respectively. While CdTe is a well-known material for the fabrication of nuclear radiation detectors operating at room temperature, the eventual functional attraction of Hg_{1-x}Cd_xI₂ is represented by the fact that its binary precursors HgI₂ and CdI₂ have a large difference in the bandgap values (2.37 eV and 3.48 eV at 4.2 K, respectively) which allows the alloy bandgap variation in the about 1 eV region.

The present paper reports on the results of experimental studies of the growth and characterization of Hg_{1-x}Cd_xI₂/CdTe-based heterostructures that have been conducted in order to investigate materials science aspects relevant to their use in X-ray radiation detectors.

References

- [1] N.V.Sochinskii, V.Muñoz, J.M.Perez, J.Cárabe, A.Morales. Appl. Phys. Lett. 72 (N° 16), 2023-2025 (1998).
- [2] E.Alves, M.F. da Silva, J.C.Soares, N.V.Sochinskii, S.Bernardi. Nuclear Instr. Meth. B 136-138 (N° 1-4), 220-224 (1998).
- [3] N.V.Sochinskii, V.Muñoz, V. Bellani, L. Viña, E.Diéguez, E.Alves, M.F. da Silva, J.C.Soares, and S.Bernardi. Appl. Phys. Lett. 70, 1314-1316 (1997).
- [4] N.V.Sochinskii, V.N.Babentsov, M.Fiederly. J. Crystal Growth 262, 191-195 (2004).
- [5] E. Saucedo, V. Corregidor, L. Fornaro, N.V. Sochinskii, J. Silveira, E. Diéguez European Journal of Physics: Applied Physics 27, 1-3, 207-212 (2004).
- [6] N.V.Sochinskii, V. N. Babentsov, P. J. McNally, A. Dundee, C. Corsi. Infrared Phys. 46, 181-184 (2004).
- [7] E. Saucedo, L. Fornaro, N.V. Sochinskii, A. Cuña, V. Corregidor, D. Granados, E. Diéguez IEEE Trans. Nuclear Science 51, 6, 3105-3110 (2004).
- [8] N.V. Sochinskii, J.P. Silveira, F.Briones, E. Saucedo, C.M. Herrero, L. Fornaro, V. Bermúdez, E. Diéguez J. Crystal Growth 275/1-2, 1131-1135 (2005).
- [9] E. Saucedo, C.M. Herrero, L. Fornaro, N.V. Sochinskii, E. Diéguez J. Crystal Growth 275/1-2, 471-477 (2005).