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Effects of metallization of TlBr single crystals for detector applications

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The single crystal TlBr is a promising candidate as a gamma-ray detector due to its high stopping power, density (7.56 g/cm3) and bandgap (2.68 eV). These properties allow to perform a compact device working at room temperature. However, the transport properties of TlBr were still plagued by material problems [1]. These problems are manly arisen from purity and quality of the crystal, both these properties being actively affected by the total process of detector manufacturing.

The study of initial stages of the process, namely the synthesis, crystal growth and purification, has shown the considerable variation in the material properties in respect of methods used [2]. The annealing was shown to improve the crystal quality of TlBr [3] and its purity [2], and as result the electrical, optical and X-ray properties became better. However, the electrical characteristics of the samples were time depended and not fully understood.

In this work, the making of electric contact with different methods was studied. Al, Ti, Cr, In, Sn, as well Ag- and graphite-paste were used for annealed TlBr single crystals. I-V and C-V curves were recorded. The samples were additionally characterised by x-ray rocking curve method, photocurrent measurements and under polarised light. They were also studied under Cu-radiation of x-ray powder diffractometer.

References
[1] –A. Owens and A. Peacock, Nucl. Instr. and Meth. A 531, 18 (2004)
[2] –V. Kozlov, M. Leskelä, T. Prohaska, G. Schultheis, G. Stingeder, H. Sipilä, Nucl. Instr. and Meth. A 531, 165 (2004)
[3] –V. Kozlov, M. Leskelä, H. Sipilä, Nucl. Instr. and Meth. A 546, 200 (2005)

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