View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by PUblication MAnagement

Interface shape control and tellurium inclusion concentration distribution in CdZnTe crystals grown by vertical Bridgman for X-ray detector applications.

A. Zappettini, L. Marchini, N. Zambelli, M. Zha, N. Auricchio, E. Caroli.

In spite of the efforts devoted to the task, many problems connected with the growth of CdZnTe (Zn>0) crystals are still unresolved, in particular tellurium inclusion density control, large single crystalline yield, seeding, and interface shape control. Moreover, also the electrical properties of the crystals (high resistivity and mobility-lifetime product) must be taken into account if detector performances have to be improved.

In this work, the authors report on the growth and characterization of several CdZnTe crystals (Zn=10%) by vertical Bridgman, with and without the use of boron oxide as encapsulant.

Different techniques were used to characterize the crystals: i) PL mapping for determining interface shape and to study the nucleation ii) a novel IR mapping apparatus to obtain fully 3D reconstruction of the inclusion distribution iii) X-ray detector characterization by means of nuclear sources to study the transport properties of the material (with mobility-lifetime product for electrons up to 6x10-3 cm2/V).