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**Influences of solid/liquid boundary layer thickness and tilting angle on zone-refinement of germanium crystals** GANG YANG, YUTONG GUAN, HAO MEI, GUOJIAN WANG, DONGMING MEI, University of South Dakota — In zone-refining of metals, solid/liquid (S/L) boundary layer thickness has an influence on segregation coefficient of impurity atoms. Additionally, the segregation of impurity elements during zone refining can be maximized by adjusting the zone refinement tube with a proper angle. In this paper, we report the influences of S/L boundary layer thickness on the segregation coefficients of boron, phosphor, aluminum and gallium, which have been identified as four main impurities in germanium crystal by Photothermal Ionization Spectroscopy (PTIS). The thickness of S/L boundary layer was found by using a well-known model to fit the experimental data. The optimized segregation coefficients have been used to calculate the impurity distribution along the purified ingot. In addition, we have also optimized the tilting angle of the germanium ingot to investigate the impact on the segregation. This work is supported by DOE grant DE-FG02-10ER46709 and the state of South Dakota.

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