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Tracing the phosphorus contamination sources and reducing the phosphorus contamination in HPGe crystal growth[1] GUOJIAN WANG, YUTONG GUAN, GANG YANG, JAYESH GOVANI, MUHAMMAD KHIZAR, HAO MEI, DONGMING MEI, university of South Dakota — The net impurity concentration and the dislocation density for the grown crystals must be controlled within a narrow range of values to produce crystals acceptable for large-volume coaxial germanium detector fabrication. Phosphorus is the main shallow level donor in high purity germanium crystal. The phosphorus contamination is a disaster for growing p-type high-purity germanium crystal. The phosphorus contamination mainly comes from crucible, insulation, ambient gas or crystal growth chamber. Regrowth method was used to trace the phosphorus contamination sources. The contamination level from sources was discussed in detail in this paper. For different contamination source, targeted approaches were used to reduce the contamination.

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