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PTIS (Photo-Thermal Ionization Spectroscopy) and its application in HPGe purification and crystal growth YUTONG GUAN, JAYESH GOVANI, GANG YANG, GUOJIAN WANG, CHAOYANG JIANG, DONGMING MEI[1], Univ of South Dakota — Detector fabrication requires high pure Germanium crystal with impurity level of $\sim$ 1010/cm3. To reach such a low impurity level, it's important to identify the impurity and trace its source during zone refining and crystal growth. PTIS (Photo-thermal ionization spectroscopy) is the combination of Fourier Transform Infrared Spectroscopy and photo-thermal ionization of shallow impurities (acceptors and donors). Working with JASCO, we have developed a PTIS at USD. With a PTIS in house, we identify the major impurities, boron, aluminum and phosphor, in HPGe. The feedback is provided to control the parameters and procedure for the zone refining and crystal growth.

[1]PI

Yutong Guan
Univ of South Dakota

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