

Abstract Submitted  
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**Oxygen in B<sub>2</sub>O<sub>3</sub> covered Czochralski-grown Ge** TOSHINORI TAISHI, Institute of Carbon Science and Technology, Shinshu University, HIDEAKI ISE, YU MURAO, TAKAYUKI OHSAWA, YUKI TOKUMOTO, YUTAKA OHNO, ICHIRO YONENAGA, Institute for Materials Research, Tohoku University — Ge has been regained keen interest in applications of Ge for ultra-fast CMOS and PV devices. High quality Ge crystals should be demanded for realization of such devices with higher performances in these circumstances. Oxygen impurity can be expected to enhance thermo-mechanical stability of Ge crystals due to dislocation locking similar to oxygen in Si. For the purpose, we grew oxygen-enriched Ge crystals by the Czochralski method from B<sub>2</sub>O<sub>3</sub> covered melt added with GeO<sub>2</sub> powder in a silica crucible. To evaluate precious knowledge oxygen behavior in Ge, local vibrations of oxygen were evaluated by FT-IR spectroscopy. Concentrations of interstitially dissolved oxygen impurity in the crystals were in the range between  $8.5 \times 10^{15}$  and  $5.5 \times 10^{17}$  cm<sup>-3</sup> determined from the FT-IR absorption at 855 cm<sup>-1</sup> originating in local vibration of Ge-O<sub>i</sub>-Ge quasi-molecules. Absorption peaks relating to GeO<sub>x</sub>, SiO<sub>x</sub> and Si-Oi-Si were not detected in the as-grown crystals. By prolonged annealing at 350\_C, an absorption peak developed at 780 cm<sup>-1</sup>, indicating formation of oxygen related thermal donors. Such donors disappeared by annealing at 550\_C.

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