Contribution ID: **34** Type: **Oral**

X-ray and alpha-ray detection properties of TlBr polycrystalline films

Friday, November 8, 2024 7:45 AM (10 minutes)

Thallium bromide (TlBr) is a semiconductor material with a band gap of 2.68 eV. TlBr has a large atomic number (81, 35) and a high density (7.56 g/cm 3), and therefore exhibits high absorption efficiency for X-rays and gamma rays. Due to these excellent physical properties, TlBr is being researched as a suitable material for semiconductor detectors operating at room temperature. TlBr has a low boiling point and can be easily volatilized by resistance heating in a vacuum atmosphere, making it possible to form a thin film by vacuum deposition. Film formation by vacuum deposition may be suitable for the manufacture of X-ray FPDs (Flat Panel Detectors) that require a large area. A 30um thick film was obtained by vacuum deposition. Measurements by XRD, FE-SEM, and EBSD revealed that the film was a TlBr polycrystalline film with a grain size of 5 - 10 μm. When a bias voltage was applied to the TlBr film and X-rays were irradiated, the current increased. 241Am alpha rays were irradiated, a pulse signal was measured. This study demonstrated the possibility of fabricating radiation detectors using TlBr films by vacuum deposition.

Type of presence

Presence online

Primary author: TOYOTA, Kouhei (Shizuoka University)

Co-authors: KASE, Hiroki (Shizuoka University); NISHIZAWA, Junichi; TAKAGI, Katsuyuki (Shizuoka University, ANSeeN Inc.); AOKI, Toru (Shizuoka University, ANSeeN Inc.)

Presenter: TOYOTA, Kouhei (Shizuoka University)

Session Classification: Radiation Detectors and Detector Materials