

International Conference on Safety and Security of Radioactive Sources: Accomplishments and Future Endeavours (CN-295)



Contribution ID: 187

Type: Poster

Gadolinium Based Scintillators for Thermal Neutron Detection

Wednesday, 22 June 2022 16:15 (15 minutes)

Neutron detectors are used in various applications in nuclear security and nuclear safety. Most efficient neutron detection systems used in nuclear security and nuclear safety are based on the ^3He technology. The growing demand for it already exceeds production in the next few years leading to an exponential increase of the price. The last decade has been driven by the quest for finding competitive alternative technologies to replace ^3He base detectors. Gadolinium (Gd) is a promising rare earth element processes the largest thermal neutron absorption cross section of all the stable elements. Scintillator material based on Gd shows a high potential for the deployment of efficient and cost-effective detectors for thermal neutron detection. This poster describes the investigation and fabrication of $\text{Gd}_2\text{O}_3:\text{Eu}^{3+}$ and $\text{GdBO}_3:\text{Eu}^{3+}$ phosphors as thin scintillator layers for thermal neutron detection. Performances of laboratory samples were tested using photoluminescence, Gamma and X-ray sensitivity.

Country OR Intl. Organization

Brunel University London, UK

Primary author: GUNARATNA MUDIYANSELAGE, Nadeera Hemamali (Brunel university London)

Co-authors: Dr SMITH, David (Brunel University London); Prof. HOBSON, Peter (Queen Mary University)

Presenter: GUNARATNA MUDIYANSELAGE, Nadeera Hemamali (Brunel university London)

Session Classification: Poster Session 2

Track Classification: 12. Sustainability and effectiveness of safety and security systems and measures, including emerging technologies