



Contribution ID: 306

Type: Oral Presentations

## Irradiation effects of swift heavy ions on palladium films deposited on 6H-SiC substrate

Wednesday, 30 January 2019 11:15 (15 minutes)

The irradiation effect of swift heavy ions on palladium (Pd) films deposited on 6H-SiC was investigated. The samples were irradiated by  $Xe^{26+}$  ions with the energy of 167 MeV at fluences of  $1 \times 10^{13} \text{ cm}^{-2}$  and  $3 \times 10^{14} \text{ cm}^{-2}$  at room temperature. Phase identification, residual stress and surface morphology were investigated with X-ray diffraction (XRD), synchrotron diffraction and scanning electron microscopy (SEM). The results showed that the as-deposited sample was composed of Pd and SiC with no evidence of a reaction between Pd and SiC. No reaction was observed for the lower irradiation fluence, only an increase in the Pd peak intensities was observed indicating improvement in the crystallinity of the material. A reaction between Pd and SiC forming PdSi and Pd<sub>2</sub>Si was observed after irradiation at a fluence of  $3 \times 10^{14} \text{ cm}^{-2}$ . The stress measurements indicated that the films were having tensile and biaxial stress not exceeding 200 MPa. A decrease in stress values was observed with an increase in irradiation fluence. The surface morphology of the as-deposited was flat and composed of small granules. There was an increase in granule sizes due to irradiation at  $1 \times 10^{13} \text{ cm}^{-2}$ . Irradiating at  $3 \times 10^{14} \text{ cm}^{-2}$  caused grain agglomeration and clustering.

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**Session Classification:** AfLS2

**Track Classification:** AfLS2 track