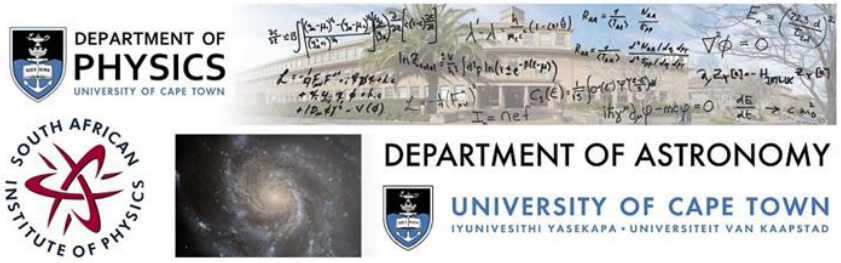

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Formation of a Thin Film of AB compound Layer at a Low Irradiation Temperature under the Influence of Radiation Induced Interstitial.

Thursday, 7 July 2016 11:10 (20 minutes)

Abstract content
   (Max 300 words)
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A radiation-induced defect generation approach is developed that describes the formation of a thin-film of an AB compound layer under the influence of radiation-induced interstitial. The A and B immiscible layers are irradiated with a beam of energetic particles and this process leads to the displacement of lattice atoms in both layers by energetic particles. A number of surface lattice atoms in A and B layers moves into interstitial sites and thereby become A and B interstitial atoms. The interstitial atoms diffuse via interstitial mechanisms to the reaction interfaces A/AB and AB/B. The AB compound layer formation occurs as a result of chemical transformation between the diffusing interstitial atoms and surface lattice species at reaction interfaces. This chemical reaction takes place under a diffusion limited process due to the dependence of reaction rate on both interstitial and surface lattice species' densities. The approach described here reveals radiation- induced interstitial (a radiation enhanced diffusion type) as the dominant diffusion mechanism during the formation of a thin-film of an AB-compound layer. This process takes place at a temperature lower than AB compound layer formation under non-radiation process using cobalt silicide and tungsten disilicide as a case study. This approach is in good agreement with experiment.

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