Contribution ID: **55** Type: **Oral Presentation**

A Steady State Model For Interfacial Reaction And Binary Diffusion In Si-Pd System

Tuesday, 8 July 2014 14:40 (20 minutes)

Abstract content
   (Max 300 words)
Formatting &
Special chars

A steady state model that explains an interfacial interaction and diffusion in binary couple of a-b system is proposed in this article. Within the framework of the model, a-atoms diffuse from a-layer of the binary system toward the b-layer and react with b-atoms to form ab-atoms. The layer of ab-atoms that grows on the b-layer, at first, is initially governed by chemical reaction and as time passes it becomes diffusion controlled. The concentration of a-atoms changes as time progresses because they are the dominant diffusing species in the binary system. But the number of b-atoms per unit volume of b-layer remains unchanged because we assume that they are practically immobile. During the chemical controlled phase of the process, the growth of ab-atomic layer is directly proportional to the annealing time. As diffusion reaction dominates the process, the ab-atomic layer thickness increases parabolically with the annealing time.
We, therefore, use our model to estimate the thickness of growth of ab-atomic layer with the corresponding critical annealing time at the point of transition between linear and parabolic growth process of the layer.
The interfacial reaction and diffusion in binary Si-Pd system is also discussed in line with the theory of our model.

Apply to be
 considered for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD)?

PhD

Main supervisor (name and email)
and his / her institution

Prof.P.A.Selyshchev, selyshchev@gmail.com
University of Pretoria

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

Primary author: Mr AKINTUNDE, Samuel (University of Pretoria)

Presenter: Mr AKINTUNDE, Samuel (University of Pretoria)

Session Classification: DPCMM1

Track Classification: Track A - Division for Physics of Condensed Matter and Materials