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## The Surface Orientation Dependence of the Pre-Exponential Factors Extracted from the Segregation Profiles of a Cu(111/110) Bi-crystal

*Wednesday, 13 July 2011 17:00 (2 hours)*

Previous experimental investigations have only shown, without explanation, that the pre-exponential factor ( $D_0$ ), in the diffusion coefficient of Sb segregating in Cu, is dependent on the surface orientation of a crystal. In this study, the surface concentration of Sb in a Sb doped Cu(111/110) bi-crystal was measured using a method combining AES and linear temperature heating. Segregation parameters, including the  $D_0$ 's are extracted from the experimental data of surface concentration versus temperature using the modified Darken model. The difference in the two pre-exponential factors  $D_0$  (Sb in Cu(111)) and  $D_0$  (Sb in Cu(110)) is explained thermodynamically in terms of entropy change  $\Delta S$  that is calculated, for the first time, for a Cu(111/110) bi-crystal.

**Level (Hons, MSc,   
 &nbsp; PhD, other)?**

MSc

**Consider for a student   
 &nbsp; award (Yes / No)?**

Yes

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

Yes

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