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Measuring the effect of surface evaporation on the segregation process

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Metallurgical products play an important role in everyday life. The search for alloys with better material properties such as strength, wear and corrosion resistance continues to this day. In addition to these desirable properties, the search for ways to reduce production costs and time has led to a large amount of research being conducted on the processes which determine the material properties of metals and alloys. One of these processes is known as segregation. To improve segregation studies the influence of surface evaporation should be considered. As experimental segregation studies are performed under high vacuum conditions, certain elements are prone to this neglected phenomenon. Although some attempts have been made to develop segregation models that take surface evaporation into account, these models can only predict segregation in either the kinetic region or when equilibrium has been reached. In addition the effect of evaporation has received little attention in previous experimental studies. In this study surface evaporation during segregation of a Sb/Cu system was measured. These results together with the modified Darken model will be used to simultaneously predict kinetic and equilibrium segregation including the effects of surface evaporation. A first approximation will be discussed as well as modifications made to an Auger system in order to measure the actual surface evaporation that takes place during segregation.

**Level (Hons, MSc,
 PhD, other)?**

PhD

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

Yes

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

Yes

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