1. Introduction

During the manufacturing process of automotive components, metallic alloys are often heated for prolonged period. At such high temperatures, elements of low bulk concentration have high mobility and tend to diffuse to the surface and grain boundaries [2]. The phenomenon is known as segregation and it may be a significant hurdle for manufactures, as it causes a failure of components that were heated, welded or operating at elevated temperatures. Segregation studies thus had their origin in finding solutions to temper embrittlement caused by grain boundary segregation and it has been extensively investigated by pioneers such as MacLean [3].With the advent of surface analysis techniques, these studies became experimentally viable and indispensable. In this work segregation is defined as the redistribution of solute atoms from the bulk to the surface.

1.1Research Objectives

The research objectives is aiming at producing a binary alloy that has the following elements namely Iridium and Copper. In this regard, copper is the solvent (host) and Iridium is proposed to be the dorpant.The main reason is that, Iridium has superior metallurgical properties, including its ability to resist corrosion, even at temperatures as high as 2000 °C. Again, it is the only metal to maintain good mechanical properties in air at temperatures above 1,600 °C. Therefore, based on the properties mentioned above, Iridium has been included in the development of the Ir-Cu alloy.

1.2 Experimental

After evaporation of the Iridium sample on to copper. The alloy will be annealed to ensure a homogeneous Ir distribution through the Cu bulk. This will be done by first sealing the samples in quartz vials filled with argon to prevent oxidation of the samples, and then using a Lindberg furnace to anneal the samples over a period of time at a temperature of 950^{o}C for 25 to 30 days. [1].

1.3 Future Work

After the above work is done successfully. The following task will be to develop a ternary alloy in the same manner as above.

Bibiliography

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