

## **Microstructure Investigation of Hypereutectic Al-Si Alloy Using Slope Plate Casting**

In this work, the effects of the overheating temperature and tilt angle on the microstructure and hardness of a hypereutectic Al-23%Si alloy were investigated. Al-23%Si melt was overheated to (760, 790, 820 and 850) °C and poured onto slope plate continuously cooled with water circulation underneath, with various tilt angles (40, 50, 60)° using a constant cooling length (300 mm). After, the melt became a semi-solid; the slurry was then filled the mould and completely solidified. Slope plate samples were reheated to a semi-solid temperature (550)°C for (10 min) and then quenched in water. Microstructural images analysis showed that the grain size and the shape factor of ( $\beta$ -Si) phase were decreased with increasing of the overheating temperature and tilt angles, on other hand, the volume fraction of ( $\beta$ -Si) phase was increased. The results of the reheating route showed that the grain size of ( $\beta$ -Si) phase was slightly increased after reheating at all overheating temperatures and tilting angles. On other side, the shape factor was improved, and the volume fraction of ( $\beta$ -Si) phase was decreased, as compared with slope plate results.