

## **EFFECTS OF BORON CARBIDE ADDITION ON HARDNESS AND MICROSTRUCTURE OF Al-Si/B<sub>4</sub>C COMPOSITE**

Anis Syukriah Ibrahim<sup>1</sup>, Abdul Razak Daud<sup>\*1</sup> and Yusof Abdullah<sup>2</sup>

<sup>1</sup>*Department of Applied Physics, Faculty of Science & Technology, National University of Malaysia, 43600, Bangi Selangor, Malaysia*

<sup>2</sup>*Malaysian Nuclear Agency (Nuclear Malaysia), 43000, Bangi Selangor, Malaysia*

*\*Corresponding author: razak\_daud@hotmail.com*

### **ABSTRACT**

The aim of this research was to study the microstructure and microhardness of the Al-Si/B<sub>4</sub>C composites containing 2-8 wt% of B<sub>4</sub>C. The composites were prepared by stir casting technique. Homogenization treatment was carried out at temperatures of 540°C for 4 hr and followed by ageing at 180°C and 220°C for 2 hr. Vickers microhardness test was performed to the composites. Microstructural study was carried out by optical microscopy. The results showed that the increase in boron carbide content seemed to increase the hardness of the composites. Heat-treatment had increased the hardness further due to spheroidization of Si. The presence of B<sub>4</sub>C did not affect the microstructure of Al-Si alloy matrix significantly.

*Keywords: Aluminum-Silicon Alloy; Boron Carbide; Stir Casting;*

<http://journal.masshp.net/all%20journal/VOLUME%2021%20No%201%20&%202%202013/08%20Anis%20Syukriah%20Ibrahim%2055-61.pdf>

### **REFERENCES**

- [1]. Naher, S., Brabazon, D., & Looney, L. *Journal of Materials Processing Technology* **143-144** (2003) 567
- [2]. Sarikaya, O., Anik, S., Aslansar, S., Okumus, S.C., & Celik, E. *Materials & Design* **28** (2007) 2443.
- [3]. Mohanty, R.M., Balasubramanian, K., & Seshadri, S.K. *Materials Science and Engineering A* **498** (2008) 42
- [4]. Sharifi, E.M., Karimzadeh, F., & Enayati, M.H. *Material and Design* **31** (2011) 3263
- [5]. Zhang, Z., Chen, X.G., & Charette, A. *J Mater Science*. **42** (2007) 7354
- [6]. Wahab, M.N., Daud, A.R., & Ghazali, M.J. *International Journal of Mechanical and Materials Engineering* **4** (2) (2009) 115
- [7]. Canakci, A., Arslan, F., & Yasar, I. *Journal Material Science*. **42** (2007) 9536