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Microstructure, Mechanical and Thermal Behaviour of Al-Clay Composite Material Developed by Stir Casting Technique

SHASHI PRAKASH DWIVEDI * AND AMBUJ SAXENA

G. L. Bajaj Institute of Technology & Management, Greater Noida, Gautam Buddha Nagar, Uttar Pradesh., India

***Abstract**–Present study deals with the development of aluminium based composite reinforced with clay particles with an average size of 50 μ m. Stir casting technique has been employed to develop the composite material. The weight percentage of clay varied from 2.5 % to 17.5 %. Microstructure and Mechanical Behaviour of clay reinforced aluminium based composite were identified. Microstructure image of Al/12.5 % composite showed fair distribution as compared to other selected composition. Interfacial reaction layer developed between the clay and aluminium alloy has been also observed to identify the bond strength between the reinforcement material and matrix material. Interfacial reaction layer between the clay and aluminium alloy showed proper wettability between the reinforcement and the matrix material. Results showed that tensile strength and hardness were improved significantly by adding 12.5 wt. % of clay in aluminium alloy. However, ductility of the composite material continuously decreased by adding the clay in the aluminium alloy. Thermal expansion behaviour of the composite material has been also identified to observe the effect of clay addition in the aluminium alloy.*

Keywords: Clay; composite; hardness interfacial reaction layer; microstructure; tensile strength.