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Development of Al-Clay Composite by Friction Stir Process and Its Characterization

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Abstract–*Waste materials are increasingly used as reinforcement to make composites with aluminum. Efforts are also being made to stop the pollution generated by them by using waste materials as well as to increase the property of aluminum. In this study also waste material clay is utilized for the fabrication of aluminium based composite material. Friction stir process (FSP) is used to fabricate the composite material. The microstructure of developed composite showed the uniform distribution of clay particles in the aluminium alloy. XRD of developed composite showed the presence of Al, SiO_2, Al_2O_3, Fe_2O_3 and MgO phases. Tensile strength and hardness of developed composite improved significantly. However, toughness and ductility of the composite material were reduced after adding the clay particles in the aluminium alloy.*

Keywords**:** Clay particles; ball-milling; FSP; Tensile strength; Hardness; XRD