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Abstract

Among various non-ferrous materials, aluminium and its alloy are considered to be one of the challenging materials having high structural characteristics, superior physical and tribological properties. Nowadays, it has substituted high-density materials in automobile, marine and aerospace applications owing to its high strength to weight ratio. In the field of aluminium matrix composite, most of the research works have been carried out with carbide, alumina and boride as reinforcement. Nitride and Oxide are also suitable materials to be used as reinforcement. The tribological studies of nitride and oxides with different load conditions along with mechanical properties were not fully explored. Therefore, the primary objective of this work is to investigate the mechanical properties and wear rate of hybrid aluminium matrix composite reinforced with nitride and oxide. The microstructural studies of the composite were carried out through scanning electron microscope, in order to examine the morphology of reinforcement and the wear surface behaviour of specimens. Tensile strength of composite increased 34% with the inclusion of 6% silicon nitride and hardness increased 60% than the base alloy. Wear resistance of composites improved considerably with the inclusion of Si₃N₄/MgO reinforcements.



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