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Abstract:

The friction and wear characteristics of stainless steel diffused with Si-based ceramics were investigated using pin-and-disc configuration under reciprocation motion, rotational motion, and simultaneous motion. The pin material was diffused by the combination of 60% Ti_2O_3 , 30% Al_2O_3 , and 10% Si_2O_3 . Experiments have been carried out both in diffused and non-diffused conditions. Both the friction coefficient and wear rate have been possible to reduce by diffused pin material. The effects of both friction coefficient and wear rate have been studied on ceramics composites at different pin-and-disc motions. Experiments were conducted under pin motions of 0.15–0.25 m/s, disc motions of 0.5–0.6 m/s, and normal loads of 2.5–3.5 N. A relation was found among friction, wear and surface hardness of the composite. The friction coefficient and wear resistance were improved of stainless steel diffused with ceramics. Scanning electron microscopic analysis was performed to observe the morphology of ceramic and pin material.