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Experiment Study on Tribological Performances of GNPs/MoS_2 Coating

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ABSTRACT: Graphene is considered as a promising lubrication material due to its high stiffness, strength and good thermal conductivity. Therefore, it is feasible to add graphene nanoplatelets (GNPs) in molybdenum disulfide (MoS_2) to improve the tribological performances of the latter. Past studies on graphene/MoS_2 focused mainly on its numerical simulation, while associated experimental researches are seldom reported. In the present study, the GNPs/MoS_2 and MoS_2 coatings are fabricated on GCr15 steel (i.e., the test piece) by air spraying. Then effects of the GNPs content on the coefficient of friction (COF) and wear of the coating are investigated experimentally. The experimental results show that the addition of GNPs can effectively improve the tribological performances of MoS_2 coating. The COFs and wear of GNPs/MoS_2 coating are related closely to the applied load and rotational speed of the disc.

Keywords: graphene nanoplatelets; molybdenum disulfide; coefficient of friction; wear; experiment