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## Friction and wear behaviour of silicon carbide/graphene composites under isooctane lubrication

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### Abstract

The tribological performance of silicon carbide (SiC)/graphene nanoplatelets (GNPs) composites is analysed under oscillating sliding tests lubricated with isooctane, looking to explore their potential as components for gasoline direct injection (GDI) engines. High graphene filler contents (20 vol.% of GNPs) are required to substantially reduce the friction coefficient of SiC ceramics, attaining decreases on friction up to 30% independently of the applied load. For all materials and testing conditions a mild wear regime is evidenced. SiC/20 vol.% GNPs composite also enhances the wear resistance up to 35% at low load, but the addition of GNPs produces a deleterious effect as the load augments. The tribological behaviour depends on the formation and destabilization of a solid lubricant carbon-based tribofilm and strongly correlates with the mechanical properties of the tested materials.

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