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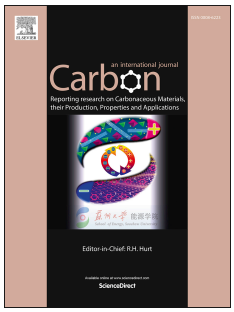

Bio-inspired graphene-based coatings on Mg alloy surfaces and their integrations of anti-corrosive/wearable performances

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Bio-inspired graphene-based coatings on Mg alloy surfaces and their integrations of anti-corrosive/wearable performances

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Abstract

Mg and its alloys generally exhibit the poor corrosion and wear resistances, which greatly limits their industrial applications. Inspired from an ordered layered structure within natural nacre, the homogeneous reduced graphene oxide/poly (vinyl alcohol) (RGO/PVA) coating is successfully fabricated on Mg alloy surface in the current study, through a facile spin-assisted layer-by-layer assembly (SA-LBL) technology. The hybrid hydrogen/covalent bond networks form between PVA chains and RGO sheets, resulting in a compact lamellar “bricks-and-mortar” structure. The microstructure of hybrid coating is strongly influenced by the cross-linking effect of PVA molecule, whose suitable content is beneficial to generating the densely stacked lamellar coating with excellent binding strength and reduced intrinsic defects, which can significantly improve its corrosion resistance. And the water molecules can hardly diffuse into

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