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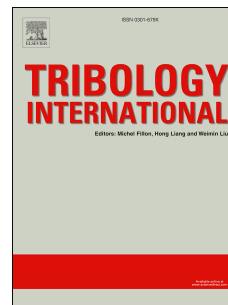
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Fabrication of novel ionic liquids-doped polyaniline as lubricant additive for anti-corrosion and tribological properties

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Abstract: Two types of ionic liquids-doped polyaniline (ILs-doped PANI) were synthesized based on an improved interfacial polymerization and evaluated as anti-wear and anti-corrosion additives in poly alpha olefin (PAO) and polyurea grease. Their nanostructures and functionalization were analyzed in detail. The anti-corrosion performance of ILs-doped PANI was assessed via salt spray test, which reveals the excellent anti-corrosion performance. Tribological tests demonstrated that ILs-doped PANI as additives can remarkably reduce friction coefficients and wear volumes in PAO and also in polyurea grease. The scanning electron microscope (SEM) micrographs and X-ray photoelectron spectroscopy (XPS) spectra of the worn surfaces suggested the excellent friction reduction and anti-wear abilities of ILs-doped PANI were strongly dependent on the synergistic lubricating effect during the friction process.

Keywords: polyaniline; ionic liquids; tribology; interfacial polymerization

1. Introduction

As the terminology is explained in mechanics, friction reflects the tangential movement resistance between two bodies in contact under the relative motion (or

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