

Wet-jet milling exfoliated hexagonal boron nitride for anticorrosive coating

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Corrosion of metals poses significant challenges to the durability and longevity of various metallic substrates in industrial applications.[1] To mitigate this issue, researchers are focusing on the development of advanced protective coatings with enhanced anticorrosion properties. Amongst the emerging strategies, the integration of two-dimensional (2D) materials has gained significant attention due to their physicochemical properties.[2]

In this work, wet-jet milling (WJM) exfoliation [3] was used to produce few-layer hexagonal boron nitride (*h*-BN) flakes [4] as a corrosion-protection pigment in polyisobutylene (PIB)-based composite coatings for marine applications.[5] This study highlights the benefit obtained by the incorporation of *h*-BN, yielding a corrosion rate of the protected structural steel as low as 7.4×10^{-6} mm year⁻¹. The 2D morphology and hydrophobicity of the *h*-BN flakes, together with the capability of PIB to act as a physical barrier against corrosive species, are the main reasons behind the excellent anticorrosion performance of the as-designed composite coating.

References

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Figures

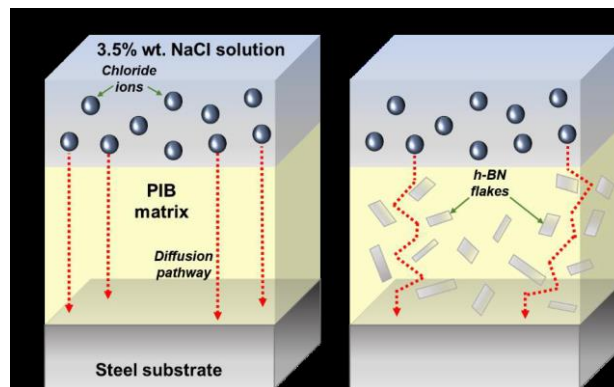


Figure 1: Schematic diagrams of diffusion pathways through a) pristine PIB and b) *h*-BN/PIB coatings.

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