

Novel Eco-friendly Nanocomposite Coatings with Antifouling and Mechanical Properties for Maritime Applications

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Biofouling represents one of the most serious problems in maritime industry¹. The aim of this study is to develop novel nanocomposite marine paints with enhanced antifouling and mechanical properties for the protection of maritime applications. For this reason, dicopper oxide and zinc oxide nanocontainers have been synthesized and loaded with natural antifoulants and corrosion inhibitors², respectively. Moreover, carbon nanotubes have been synthesized via chemical vapor deposition method and functionalized, in order to be compatible with the coatings binders³. These nanoparticles have been incorporated both in topcoat and primer coatings, offering improved antifouling performance and better mechanical integrity, respectively. The surface of the nanocomposite coatings was examined via optical and scanning probe microscopy. The mechanical properties were determined with advanced characterization techniques, such as nanoindentation and nanoscratch tests⁴, while their wettability was estimated with contact angle measurements. Finally, life cycle assessment of the production was conducted to prove the ecofriendly behavior of the novel coatings⁵.

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