

2024 年度中国腐蚀与防护学会科学技术奖申报公示表

项目名称: 仿生多功能表面的调控机制与协同防腐机理

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项目简介: 针对金属部件在液固界面的腐蚀问题, 本研究“师法自然”, 在国家自然科学基金重点项目等支持下, 历经十余年的研究, 围绕揭示典型生物体表超润湿的功能机理, 以生物多维度、跨尺度本征结构与材料组分为模本, 建立仿生微结构、成分与功能耦联关系, 模拟其物理结构的同时, 协同其成分构成, 制备既有自然界生物精巧结构, 又有对其结构的修饰、组装和多尺度复合, 从而形成精细结构、复杂组分、功能集成的新型仿生超润湿多功能表面, 基于界面润湿性控制, 实现金属表面的腐蚀调控。本研究揭示了仿生多功能表面的调控机制及材料、结构与形态等多因素协同耐腐蚀机理, 为发展新型仿生耐腐蚀技术提供新思路, 拓展了仿生超疏水表面在腐蚀防护、防冰/雾、污水处理、热传导等领域的工程应用。

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