Short Communication

Synthesis of ZIF-67@ZIF-8 with Core-shell Structure for Enhancing Epoxy Coating Corrosion Protection Property on Magnesium Alloy

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Nanocontainers with corrosion inhibitors are an effective means to protect metals from corrosion. However, such coatings need to release the inhibitors rapidly to form an on-demand barrier on the metal surface, whereas coating damage needs to be minimized to prevent excessive leakage. Herein, this function is achieved by ZIF-67@ZIF-8 nanoparticles, a metal organic frame material with core-shell structure, by acting as a functional filler. The structure and composition of ZIF-67 and ZIF-67@ZIF-8 nanoparticles are assessed by TEM, SEM and XRD. The findings of UV spectroscopy and immersion experiments show that ZIF-67@ZIF-8 nanoparticles rapidly release 2-MI to the damaged area of the metal surface in acid conditions. In addition, in a neutral environment, only limited amounts of 2-MI (less than 4%) are released. The coating has high corrosion resistance after immersion for 120 h in acidic condition, as exhibited by EIS, and thus potential application value.

Keywords: core-shell structure; metal organic framework; ZIF-67@ZIF-8; anticorrosion coating

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