

# Doped STR@mSiO<sub>2</sub>-GO Composite Coatings for Enhanced Anticorrosion Protection of Copper

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This paper presents an innovative approach to enhancing the anticorrosion performance of epoxy coatings by incorporating 2-hydroxy-5-((4-(hydroxymethyl)-1H-1,2,3-triazol-1-yl)methyl) benzaldehyde (STR) molecules into a mesoporous silica (mSiO<sub>2</sub>) matrix grafted onto graphene oxide (GO).

The resulting porous hybrid composites (STR@mSiO<sub>2</sub>-GO) were subjected to comprehensive characterization using scanning electron microscopy (SEM), Fourier-transform infrared spectroscopy (FTIR), and X-ray diffraction (XRD).

The corrosion resistance of the resulting hybrids was evaluated through salt spray testing and electrochemical impedance spectroscopy (EIS). Additionally, since TiO<sub>2</sub> is well-known for its corrosion-resistant properties, we synthesized TiO<sub>2</sub>@mSiO<sub>2</sub>-GO composites by embedding TiO<sub>2</sub> nanoparticles into the mSiO<sub>2</sub>-GO matrix to further enhance the corrosion resistance of epoxy coatings in harsh environments.

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