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## Novel Metal-Organic Framework Nanosheets Developed for Anticorrosive Coating

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The marine functional materials group led by Prof. WANG Liping at the Ningbo Institute of Materials Technology and Engineering (NIMTE) of the Chinese Academy of Sciences (CAS), has successfully prepared ultrathin metal-organic framework (MOF) nanosheets via surfactant-assisted bottom-up method.

The developed two-dimensional (2D) MOF nanosheets enhanced anticorrosion properties of composite coatings. This study was published in [Corrosion Science](#).

As a vital branch of 2D material, organic framework material has attracted increasing interest. However, water poses a serious threat to its structure, which significantly influences the stability of material in the metal protection field.

To address this issue, the research group at NIMTE synthesized MOF nanosheets with excellent water stability, by virtue of adding polyvinylpyrrolidone (PVP) as the surfactant to achieve the pre-assembly and coordination between  $\text{Cu}^{2+}$  ions and porphyrin ligands.

The obtained ultrathin nanosheets with thickness of 1~3 nm, showed more uniform scale and higher yield (57%) than those prepared through traditional liquid exfoliation methods.



The preparation of MOF nanosheets via traditional vs. surfactant-assisted methods

In addition, the synthesized 2D MOF nanosheets were applied as nanofillers into epoxy thermoset to improve its barrier performance against the corrosive media. Measurement results indicated that the prepared nanosheets can effectively prevent the water permeation, thus significantly improve anticorrosion properties of coatings for a wider range of practical

applications.

This work paves the way for the research and development of materials and devices in relevant fields, such as photocatalysis and gas separation.

Read the [original article](#) on Chinese Academy of Sciences (CAS).