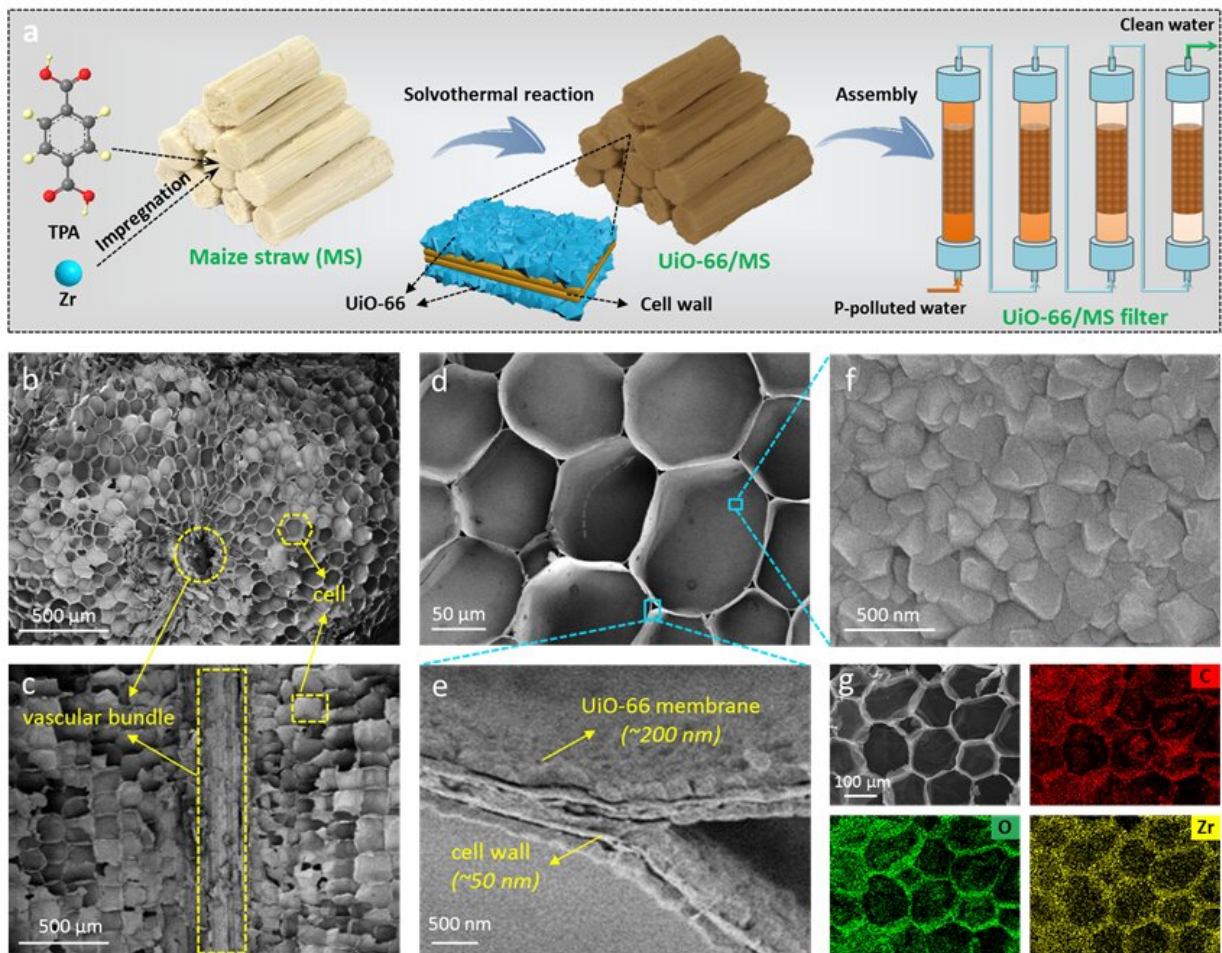


Fabrication of filter with waste maize straw for efficient phosphate removal

May 9 2022, by Li Yuan



Synthesis and morphology of UiO-66/MS filter. Credit: Li Dechang

Metal-organic frameworks (MOFs) are promising as adsorbents for

pollutants removal due to their high surface area, low density, tunable porosity and potential for increased adsorption capacities.

However, MOFs are often synthesized as fine powders with particle sizes in nanometer/micrometer range, which are not suitable for practical application due to the limitations in processing and recycling. Shaping MOFs into application-oriented forms meanwhile maintaining their [intrinsic property](#) is important but challenging.

Recently, a research team led by Prof. Wang Guanghui from the Qingdao Institute of Bioenergy and Bioprocess Technology (QIBEBT) of the Chinese Academy of Sciences (CAS) has fabricated a novel UiO-66/MS filter and assembled it into an all-in-one device for continuous phosphate removal from wastewater.

This work was published on April 19 in the *Chemical Engineering Journal*.

The researchers fabricated the UiO-66/MS filter by constructing UiO-66 membrane on the cell wall of waste maize straw (MS) through a simple solvothermal process. The unique biological structure of MS provided well-developed channels for [mass transfer](#), and the UiO-66 nanoparticles were uniformly anchored on the cell walls of MS to form a monolayer membrane, promoting the exposure of adsorption sites.

"Due to the structural advantages, the UiO-66/MS filter exhibits outstanding efficiency for phosphate removal," said Li Dechang, first author of the study.

"This study provides not only a scalable and economical method to synthesize efficient UiO-66/MS filter for phosphate remediation, but also an approach for value-added utilization of the waste maize straw," Prof. Wang said.

More information: De-Chang Li et al, Filter fabrication by constructing metal-organic frameworks membrane on waste maize straw for efficient phosphate removal from wastewater, *Chemical Engineering Journal* (2022). [DOI: 10.1016/j.cej.2022.136461](https://doi.org/10.1016/j.cej.2022.136461)

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