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Titanium dioxide and formaldehyde retained in porous media

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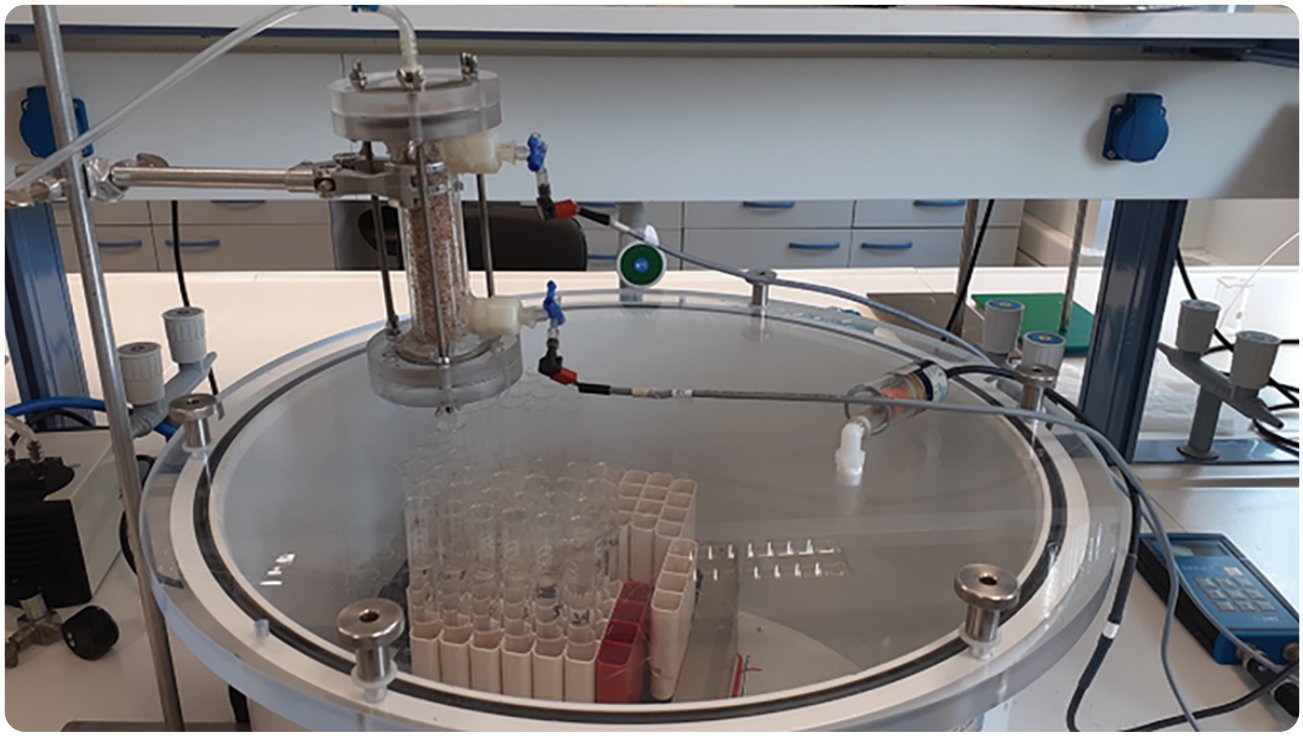

Unsaturated packed column on top of a vacuum chamber. Photo by T.V. Fountouli.

Titanium dioxide (TiO_2) is one of the most commonly used metal oxides in numerous commercial products, environmental remediation applications, and agriculture. Also, formaldehyde (FA) is a toxic organic substance used in many applications. Extensive use of these substances inevitably leads to their release into the environment with potential harmful effects to natural ecosystems and human health.

In an article recently published in the *Vadose Zone Journal*, researchers investigated the simultaneous transport of TiO_2 nanoparticles and FA in columns packed with quartz sand under water-saturated and unsaturated flow conditions to understand better how they move underground.

The experimental results indicated that substantial retention of TiO_2 nanoparticles occurs in both saturated and unsaturated porous media. The investigators also found that TiO_2 nanoparticles hindered the transport of FA in both columns. The air–water interfaces present in unsaturated porous media provide additional complexity as adsorption onto these interfaces can affect the migration of nanoparticles. This study provides useful insights into the fate and transport of TiO_2 nanoparticles and FA in saturated and unsaturated porous media.

Dig deeper

Chrysikopoulos, C.V., & Fountouli, T.V. (2022). Cotransport of titanium dioxide nanoparticles and formaldehyde in saturated and unsaturated columns packed with quartz sand. *Vadose Zone Journal*, e20175.
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