

KATALOX-LIGHT®

ONE PFAS FAMILY. MANY ADSORPTION BEHAVIOURS.

Why compound-specific chemistry matters in combined treatment

PFAS is a broad family of substances. Molecular structure and the surrounding water influence how each compound interacts with mineral surfaces. Understanding these differences helps interpret treatment results.

THE MOLECULE

Head-group chemistry

PFOA and PFOS carry negatively charged head groups at typical drinking-water pH. Positively charged iron-hydroxide sites can attract these anions.

Chain length

In ferrihydrite research under acidic conditions, several longer-chain PFAS adsorbed more strongly than shorter-chain compounds. Behaviour remains specific to the material and test conditions.

PFAS mixtures

A total PFAS result can conceal different responses among individual compounds. Record each measured PFAS alongside the reported sum.

THE WATER

pH and surface charge

Changing pH changes the charge of mineral hydroxyl groups. The balance between attraction and repulsion influences adsorption.

Phosphate competition

Phosphate can occupy iron-hydroxide sites and alter surface charge, reducing PFAS uptake in ferrihydrite experiments.

Organic matter

Organic coatings change the mineral–water interface. Their influence depends on the water composition, mineral surface and PFAS being treated.

THE KATALOX-LIGHT CONNECTION

During iron treatment, fresh iron hydroxide solids can add adsorption surfaces to the filter bed. Where selected PFAS binds to retained solids, filtration contributes to separation. The contribution must be assessed in the actual water.

“**UNDERSTAND THE COMPOUND.**
UNDERSTAND THE WATER.
INTERPRET THE RESULT.”



WHAT THE RESEARCH ESTABLISHES

Campos-Pereira et al. studied 12 PFAS on ferrihydrite and found strong links between adsorption, pH and surface charge. Stronger uptake occurred under acidic, low-competition conditions. These mineral findings explain a possible mechanism; product-specific PFAS removal requires Katalox-Light measurements.



Individual PFAS concentrations



Water chemistry and operating conditions



Removal tracked over treated bed volumes

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