

## **290m Membrane-Supported Metallic Nanoparticles for the Dechlorination of Organics in Water**

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Zero-valent iron and bimetallic nanoparticles are very effective for dechlorination of organics (e.g., trichloroethylene), but are highly reactive to oxidation when exposed to air. In this work, nanoparticles have been incorporated into membranes to minimize oxidation and increase the shelf-life of these materials. In addition, the polymer phase is a strong absorbent for the organic, and retains the organic in the solid phase, even if the dechlorination rate is low. Nanoparticles have been made in solution using common microemulsion techniques. The nanoparticles are continuously kept in organic solvent to inhibit oxidation, and are transferred to the polymer phase as a slurry. Membranes are made from this polymer dispersion using phase inversion techniques. The materials show excellent absorption characteristics, and organic degradation rates similar to unsupported nanoparticles. We have observed some aging affect, and this will be discussed in the presentation. This work is funded in part through a grant by the EPA-STAR Program.