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Research Highlights

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Green chemistry: Treating waste with waste

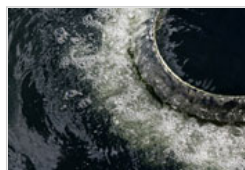
Felix Cheung

A new wastewater treatment method uses one kind of dye waste to remove another kind of dye waste, essentially 'killing two birds with one stone'

Original article citation

Zhao, D. H., Zhang, Y. L., Wei, Y. P. & Gao, H. W. [Facile eco-friendly treatment of a dye wastewater mixture by *in situ* hybridization with growing calcium carbonate](#). *J. Mater. Chem.* doi:10.1039/b911830f (2009).

Factories across the world are dumping thousands of tonnes of untreated dyes into rivers and waterways every year. The majority of these dyes are toxic to the environment and may lead to mutations and cancers in animals. Hongwen Gao and co-workers at Tongji University in Shanghai¹ have developed a novel wastewater treatment method to treat two kinds of organic dye wastes in one action.



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The method is based on inorganic-organic hybridization — a technique that is often employed in the synthesis of functional materials, such as photosensitive cells and optical thin films. To mimic real-life situations, the researchers prepared two kinds of wastewater by dissolving the anionic dye 'congo red' and the cationic dye 'methylene blue' in distilled water.

They poured both wastewaters into a rotating vessel containing sodium carbonate (Na_2CO_3). When the mixture had blended thoroughly, they added calcium chloride (CaCl_2) to the mixture. After 30 minutes, the organic dye wastes precipitated as sludge.

The wastewater treatment method is simple, cost-effective and eco-friendly. The sludge can either be stored or reused as colour fillers in polymer products.

The researchers also tested their method on industrial wastewaters purchased from dye-manufacturing plants. They found that their method could remove 71–83% of the organic compounds from these wastewaters. In theory, factories can discharge the treated water into rivers or waterways without doing much harm to the aquatic environment.

The authors of this work are from:

State Key Laboratory of Pollution Control and Resource Reuse, College of Environmental Science and Engineering, Tongji University, Shanghai, China.

Reference

1. Zhao, D. H., Zhang, Y. L., Wei, Y. P. & Gao, H. W. Facile eco-friendly treatment of a dye wastewater mixture by *in situ* hybridization with growing calcium carbonate. *J. Mater. Chem.* doi:10.1039/b911830f (2009). | [Article](#)

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