

# Cyclodextrin polyurethanes polymerised with carbon nanotubes for the removal of organic pollutants in water

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## **Abstract**

Organic compounds are some of the major pollutants of water worldwide. They can be toxic or carcinogenic even at low concentrations. The non-reactivity of these species makes it difficult to remove them from water, particularly when present at concentration levels of nanograms per litre ( $\text{ng}\cdot\text{l}^{-1}$ ) or lower. Reasonably inexpensive yet effective methods for the removal of these organic pollutants to below ppb levels are therefore required.

Insoluble cyclodextrin polyurethanes have demonstrated the ability to remove organic species from water at concentration levels of nanograms per litre. Carbon nanotubes have also been reported to efficiently adsorb some organic molecules such as dioxins and polychlorinated dibenzo-furans. However, these nanotubes are currently too expensive to be used on their own in water treatment.

An investigation into the use of cross-linked cyclodextrin polyurethanes copolymerised with functionalised multiwalled carbon nanotubes as adsorbents for organic pollutants has yielded very useful results which may have an impact in future water treatment applications.

**Keywords:** multiwalled carbon nanotubes, cyclodextrins, polymer composites, adsorption, trichloroethylene, endocrine disruptors