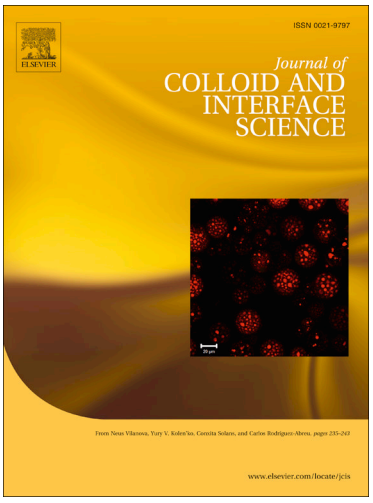


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# Shape-Dependent Adsorption of $CeO_2$ Nanostructures for Superior Organic Dye Removal

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## Abstract

Highly efficient removal of dye pollutants from water resources remains a great challenge. Herein, we demonstrate a new approach for the efficient removal of anionic organic dyes from wastewater using shape-dependent $CeO_2$ nanostructures. It was found that the volume stoichiometry ratio of ethanol to water ($EtOH/H_2O$) was a key factor affecting the $CeO_2$ nanostructures. Accordingly, the adsorption capacity of the spindle $CeO_2$ nanostructure for Congo red reached 162.4 mg $g^{-1}$, which is much higher than that of octahedral and spherical $CeO_2$ or other adsorbents previously reported. The superior adsorption performance may be mainly attributed to the peculiar structure and presence of electrostatic interactions between the sample surface and dye molecules. This finding will provide new avenues for using promising adsorbent materials for dye removal in water treatments.

***Keywords:*** Shape-control $CeO_2$; Adsorption; Congo red; Recyclability