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New sustainable hybrid material as adsorbent for dye removal from aqueous solutions

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Keywords

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Abstract

Cellulose grafted with soy protein isolate (SPI), sustainable and cost effective material, was investigated as a bioactive material for calcium phosphate mineralization. The formation of hydroxyapatite rod-like nanocrystals with ~50 nm diameter was confirmed by different characterization tools. Cellulose grafted SPI/hydroxyapatite hybrid was evaluated as recyclable adsorbent for Methylene blue (MB) from aqueous solutions using batch adsorption technique. The new sustainable material exhibited adsorption capacity up to 454 mg/g. Adsorption data were examined using different kinetics and isotherms to investigate the adsorption mechanism. After four adsorption-desorption cycles, the efficiency of MB removal is ~ 95%. These results present new sustainable, cost effective and reusable hybrid material as a promising adsorbent for organic dyes removal from waste water.

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