

## عنوان مقاله:

Synergetic photocatalytic and adsorptive removals of metanil yellow using TiO<sub>2</sub>/grass-derived cellulose/chitosan (TiO<sub>2</sub>/GC/CH) film composite

## محل انتشار:

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## خلاصه مقاله:

Chitosan (CH) and cellulose are the most abundant biopolymer which can be utilized for hazardous dye removal. By incorporating TiO<sub>2</sub> onto cellulose/CH matrix, our research aims to achieved higher metanil yellow removal by means of synergetic adsorption/photodegradation mechanisms. The cellulose particles were extracted from wild grass (*Imperata cylindrica* L.) to obtain grass-derived cellulose (GC). Simple blending method was used to prepare TiO<sub>2</sub>/GC/CH, in which the composition was determined by simple additive weighting method (SAW). TiO<sub>2</sub>/GC/CH was characterized by means of tensile strength test (also used for SAW), Fourier Transform-Infrared (FT-IR), X-ray diffraction (XRD), differential scanning calorimetry (DSC), and scanning electron microscopy (SEM). Metanil yellow removal using TiO<sub>2</sub>/GC/CH work the best at acidic pH range. The removal follows the pseudo-second-order kinetic ( $R^2 = 0.99699$ ) and Langmuir isotherm ( $R^2 = 0.99786$ ) modellings. Higher  $q_m$  obtained from the metanil yellow removal under UV .irradiation ( $q_m = 171.5266$ ) proves the synergism between adsorption and photodegradation

## کلمات کلیدی:

photocatalyst, Nanoparticle, Langmuir, Azo dye, Pseudo-second-order, Simple Additive Weighting Method

## لینک ثابت مقاله در پایگاه سیویلیکا:

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