

Heterogeneous Photocatalytic Degradation of Methylene Blue by Montmorillonite/Cu_xCd_{1-x}S Nanomaterials

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Abstract : Heterogeneous photo catalysis is an alternative method for the removal of organic pollutants in water. The photo excitation of a semi-conductor under ultra violet (UV) irradiation entails the production of hydroxyl radicals, one of the most oxidative chemical species. The objective of this study is the synthesis of nano materials based on montmorillonite and Cu_xCd_{1-x}S with different Cu concentration ($0.3 < x < 0.7$) and their application in photocatalysis of a cationic dye: methylene blue. The synthesized nano materials and montmorillonite were characterized by fourier transform infrared (FTIR). Test results of photo catalysis of methylene blue under UV-Visible irradiation show that the photoactivity of nano materials montmorillonite/Cu_xCd_{1-x}S increase with the increasing of Cu concentration and it is significantly higher compared to that of sodium montmorillonite alone. The application of the kinetic model of Langmuir-Hinshelwood (L-H) to the photocatalytic test results showed that the reaction rate obeys to the first-order kinetic model.

Keywords : heterogeneous photo catalysis, methylene blue, montmorillonite, nano material

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