

Photocatalytic Oxidative Removal of the Organic Pollutant from Wastewater using Simple Oxide Catalysts Supported on Clay

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Abstract:

The decontamination of industrial waste, given its composition, will always lead to the choice of the most suitable method for treating the contaminated water, and to this end advanced oxidation processes (AOPs) have seen great expansion in the field of environmental technologies. They are seen as a very promising means of degrading various pollutants, and various research studies have demonstrated that AOPs can effectively degrade a wide variety of micropollutants via the production of hydroxyl and other radical oxygen species. Solar photocatalysis is gradually becoming one of the alternative technologies for water purification, especially in countries with high levels of sunshine - as is the case in Algeria - and is part of a sustainable development approach using the sun as a renewable energy source [10]-[12].

The aims of this work are the elimination of crystal violet (CV) in aqueous solution by the natural clay purified from the Aïn Ouarka region of southern Algeria, the clay has been modified by the impregnation process to prepare supported catalysts based on clay of Xwt. %M_xO_y-CCA, (M = Zn, Ti and Cr), (X = 5, 15 %) where X represents the mass percentage in M_xO_y, characterize and study their efficiencies in the adsorption process and the Photocatalytic degradation of crystal violet in aqueous solution. These catalysts are characterized by different methods of physicochemical analysis (DRX, EDX, FT-IR, CEC, FRX and MEB).