

## Sensitization of semiconducting powder catalysts in water purification: Photo-degradation of medical drugs and microorganisms

Fedaa Salih, Ahed Zyoud, Majdi Dweikat and Hikmat S. Hilal

SSERL, Chemistry Department, An-Najah N. University, Nablus, Palestine  
fedaa83@live.com

Photocatalytic degradation of organic contaminants in water and air attracts great deal of attention.  $\text{TiO}_2$  is the most widely used semiconductor photocatalyst due to its high photostability, low cost, non-toxic nature, high oxidizing potential and its water insolubility under different conditions. In this work  $\text{TiO}_2$  was prepared from  $\text{TiCl}_3$  then sensitized by anthocyanin natural dye extracted from *Hibiscus (Karkade)*. The  $\text{TiO}_2$ /anthocyanin system was then used as a catalyst to photo-degrade phenazopyridine and E-coli bacteria in water. Catalytic experiments were conducted in a 100 mL magnetically stirred thermostated beaker. The out-side walls of the beaker were covered with aluminum foil. Direct visible irradiation using a solar simulator halogen spot lamp (1300 Lux,  $0.0001898\text{W}/\text{cm}^2$ ) was applied vertically to the photo-catalytic mixture surface. The contaminant concentration was measured every 25 minute by polarography.  $\text{TiO}_2$  was characterized by measuring the XRD, SEM, photoluminescence, UV-visible spectra. Different parameters were studied, such as pH, contaminant concentration, catalyst concentration and temperature. The efficiency of the catalyst increased with increasing the contaminant concentration, catalyst concentration and pH value. Photodegradation reaction rate was temperature independent. Results and discussions will be presented together with possible mechanisms.