4<sup>th</sup> International Conference on

## **Polymer Chemistry**

June 25-27, 2018 | Stockholm, Sweden

## Solar-driven photocatalytic wastewater treatment using PEDOT/TiO<sub>2</sub> nanocomposite catalyst: Comparison of various catalysts structure

Zlata Hrnjak-Murgic, Zvonimir Katancic, Petra Klaric, Nikolina Nascimento Mrakovcic and Tina Posedi University of Zagreb, Croatia

 $T_{iO_2}$  is an excellent photocatalyst under UV light but its high band gap limits its activity under visible light and restricts the practical application. The PEDOT conductive polymer was used to increase the photocatalytic activity of TiO<sub>2</sub> as conductive polymers are known to be efficient electron donor and good electron transporters upon visible-light excitation. For that reason, the nanocomposite photocatalysts of conducting polymer poly(3,4-ethylenedioxythiophene) (PEDOT) and TiO<sub>2</sub> nanoparticles were prepared by *insitu* synthesis for catalytic waste water treatment. The synthesis was carried out by chemical oxidation polymerization with FeCl<sub>3</sub> oxidant with the ratio EDOT monomer:oxidant 1:1, while the ratio of monomer and TiO2 nanoparticles was 1:10 and 1:20. Studied photocatalysts were characterized by FTIR spectroscopy, SEM microscopy, TG analysis and by the determination of conductivity. The photocatalytic activity was assessed through degradation of Acid Blue 25 dye (AB25) under simulated solar irradiation. Photocatalysis was determined as well. The effect of photocatalytic media on catalysts efficiency was also considered due to strong interactions between catalyst and pollutant. The results indicate the strong interactions of PEDOT polymer and AB25 because very high adsorption of dye onto PEDOT/TiO<sub>2</sub> nanocomposite catalysts was observed. The pH media of suspension during catalytic water treatment significantly affected those interactions and photocatalysis process.

zhrnjak@fkit.hr