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[ SEM-168 ] TiO<sub>2</sub>@G photoelectrodes sensitized with natural pigments for reduction of ammonia in aquaculture tanks with visible light

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The degradation of waste nitrogen compounds produced in aquaculture tank is commonly done through the use of biofilters (among other methods) to avoid ecosystem poisoning. An alternative method is TiO<sub>2</sub>-based photocatalyst to degrade NH<sub>3</sub> into N<sub>2</sub>. On the other hand, graphene is a material with a high charge transport efficiency which is proposed to enhance the photocatalyst system efficiency. In this work TiO<sub>2</sub> and TiO<sub>2</sub>@G films were made by Pechini method onto Fluorine-doped Tin Oxide (FTO), Aluminium-doped Zinc Oxide (AZO), Stainless Steel (SS) and Soda Lime Glass (SLG) substrates. The molar ratios in the Pechini solution were 20:5:1 of titanium isopropoxide, citric acid and ethylene glycol respectively. A mixture of Pechini-TiO<sub>2</sub>pm25 nanopowder was made and ultrasonically dispersed until a paste is formed and therefore the paste was deposited on FTO and SS substrates ( $\approx 1\text{cm}^2$ ) by doctor blade technique and later calcined up to 450 °C. Some of the electrodes were impregnated with the ethanolic extract of *Laburnum anagyroides* Medic. known as golden rain tree to sensitize it to visible light. Films were characterized by Reflectance Spectroscopy (RS), X Ray Diffraction (XRD), and current-voltage (I-V) and photodegradation activity with methylene blue. The results are discussed in terms of substrate type, graphene presence and sensitization. Financed by SIP 20151074 and CONACYT 169108