

A New Photocatalyst for Wastewater Treatment; Preparation and Application on Orange G as Organic Pollutant

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Abstract- Organic dyes and complexes such as phthalocyanines (Pcs) may show photocatalytic properties against to photocatalytic degradation of pollutants [1]. The use of metallo phthalocyanines as organic photocatalysts in solution derives from their intense absorption bands in the visible and their thermal and chemical stability against self-degradation. Pcs have the advantage of high molar absorption capacity in visible light region and their λ_{max} can be easily shifted by substitution with many different groups on peripheral and nonperipheral positions [2, 3].

In this work, a new asymmetric phthalocyanine derivative with carboxylic acid end was synthesized. Central metal atom zinc was chosen to enhance photocatalytic activity. In this work, **1** was obtained by the reaction between 6(3,4-dicyanophenoxy)-2-naphthoic acid and 4-nitrophthalonitrile. **1** was purified and then characterized by some spectroscopic techniques (FTIR, UV, HNMR and MS) and elemental analysis. Asymmetric ZnPc compound (**3**) was synthesized by reaction of **1** and **2** (Figure 1). **3** was purified by column chromatography and characterized by some spectroscopic techniques (FTIR, UV, HNMR and MALDI TOF MS) and elemental analysis. The photo catalyst for the study was prepared in this way. At the next stage, photochemical measurements of the molecule (**3**) will be made and the photocatalytic performance will be assessed. Finally, Orange G as an organic pollutants will be taken at a certain concentration and decomposed with this photocatalyst. Thus, a new photocatalyst will be prepared to remove organic pollutants in the waste water.

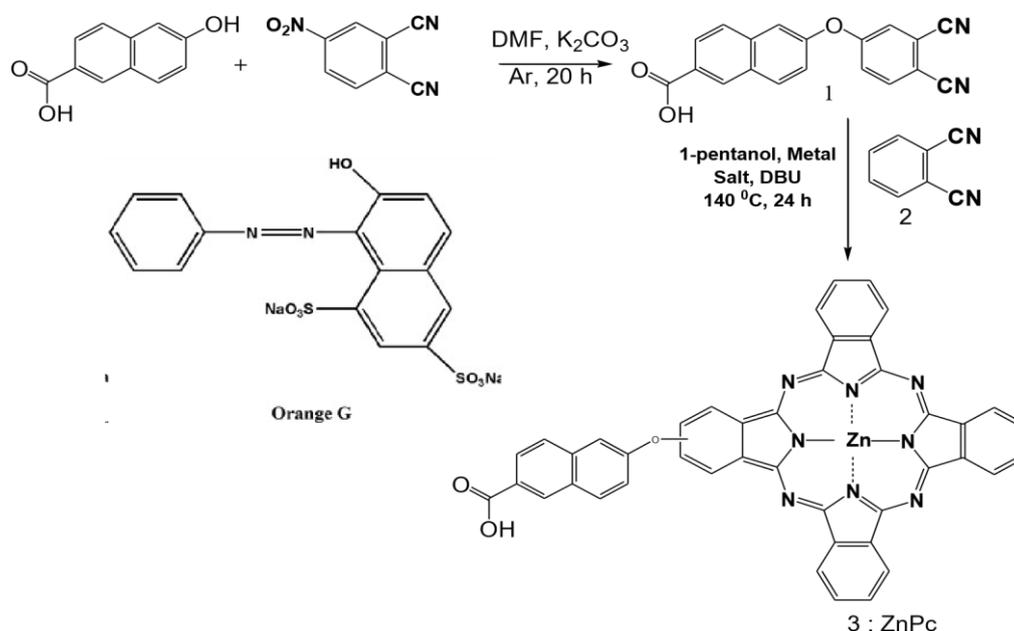


Figure 1. Synthesis method for ZnPc (3)

Keywords- Phthalocyanine, photocatalyst, orange G.

References:

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