

Abstract Submitted
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Development of TiO_2 -Xwt% InVO_4 Photocatalytic Nano-composites for Ambient Light Assisted Water Detoxification¹

SESHA SRINIVASAN, Florida Polytechnic University, College of Innovation and Technology, JEREMIAH WILSON, Tuskegee University, Department of Physics, ERIC VICKERS, RYAN INTEGLIA, Florida Polytechnic University, College of Engineering — We have developed nano-composites of TiO_2 -Xwt% InVO_4 for environmental and biomedical research applications. TiO_2 is commonly used as catalyst that utilizes the UV portion of the sun light spectrum to induce photo-oxidation and photo-reduction processes. We hypothesized that the combination of InVO_4 and TiO_2 will result in a material that will catalyze organic contaminants through photo-oxidation under visible light. We combined TiO_2 with 2,4,6,8,10wt% of InVO_4 via wet ball milling process. We have compared the various concentrations of InVO_4 on TiO_2 matrix by SEM, BET surface area analyzer, FTIR, XRD, and photodegradation of the organic contaminant Methyl Orange. After characterization we found that 4wt% InVO_4 + TiO_2 mixture displayed the most promising characteristics for photo-oxidation under visible light; From the BET surface area analysis it showed the largest surface area out of the prior mentioned $\text{TiO}_2 = \text{Xwt}\% \text{InVO}_4$ mixtures and a degradation amount equivalent to 50% of Methyl Orange contaminant over 7 hours under visible light. In conclusion, TiO_2 -Xwt% InVO_4 displayed evidence of photo-oxidation under visible light conditions.

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