Supporting Information

Microwave assisted synthesis of reduced graphene-oxide (rGO)/V_2O_5 nano-composite as an efficient photocatalyst for dye degradation

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Synthesis of precursors

Synthesis of Graphene Oxide (GO)

3 g of the graphite powder was added slowly to 69 ml H_2SO_4 and the mixture was stirred for 10 minutes. 1.5 g $NaNO_3$ was added to the above solution. Then 9 g of the crushed $KMnO_4$ was added in small lots, to prevent the temperature from increasing above 40 ^oC. After that, the solution was kept in an oil bath at 35 ^oC for 30 minutes, until the mixture turned grey. After the grey paste was formed, 138 ml of water was added very slowly along the walls of the beaker. Then, temperature was increased to 98 ^oC and maintained for 15 minutes. The solution was brought back to room temperature and 420 ml of water was added. Then 3 ml of H_2O_2 was added and color change was observed to green. The product was filtered and washed with HCl solution, ethanol, and dried at room temperature. The flow diagram for synthesis and the structure of GO are shown in Figure S 1.

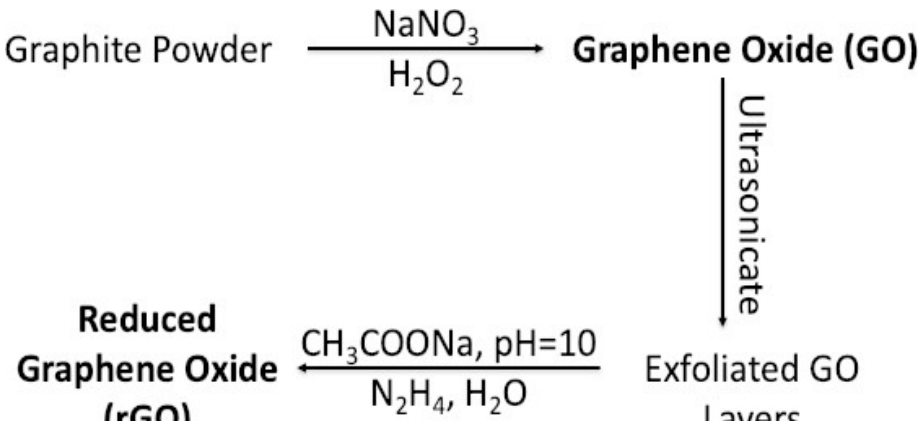

Figure S 1. Flow diagram for synthesis of Graphene Oxide (GO) and Reduced Graphene Oxide (rGO)

Synthesis of Reduced Graphene Oxide (rGO)

800 mg of the GO was dissolved in 400 ml water. The solution was ultrasonicated for 30 minutes to exfoliate the graphene oxide layers. Then, sodium acetate was added to achieve a pH of 10. After that, 2 ml of hydrazine hydrate was added the above solution. The solution was kept at 80 ^{o}C for 24 hours. The product was filtered and washed with water and ethanol several times, and dried at 50 ^{o}C for 24 hours. The flow diagram for synthesis and the structure of rGO are shown in Figure S 1.

Synthesis of $VO(acac)_2$

5 g of vanadium pentoxide (SD Fine Chem, AR grade) was added to a mixture of 10 ml of conc. H_2SO_4 in 10 ml distilled water and 24 ml of ethanol. The mixture was refluxed for 1.5 hours and cooled. 12 ml of acetylacetonate (Sigma Aldrich, 99 %) was added to the cooled mixture. The resulting mixture was neutralized by adding a solution of 40 g Na_2CO_3 in 300 ml of distilled water, while stirring using a magnetic stirrer. The mixture was then cooled in an ice water bath for about 15 minutes and subsequently filtered. The resulting dark blue-green colored product was washed with ice-cold water and dried.