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Reduced graphene oxide-silver nano particle composite as visible light photocatalyst for degradation of colorless endocrine disruptors

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Sunlight induced degradation of organic pollutants is an ideal approach for environmental pollution control and waste water treatment. Although a variety of photo catalysts have been designed toward this goal, efficient degradation of colorless organic pollutants by visible light is a challenging issue. Here, we show that a reduced graphene oxide (rGO) based composite with silver nano particle (rGO-Ag) can act as an efficient visible light photo catalyst for the degradation of colorless organic pollutants. We have developed a simple, large scale synthesis method for rGO-Ag and used it for the degradation of three well known endocrine disruptors (phenol, bisphenol A and atrazine) under UV and visible light. It is found that photocatalytic efficiency by rGO-Ag under visible light is significantly higher compared to that of rGO or silver nanoparticles. It is proposed that Ag nanoparticles offer visible light induced excitation of silver plasmons and conductive rGO offers efficient charge separation and thus induces oxidative degradation of the organic pollutant. This approach can be extended for sunlight induced degradation of different organic pollutants.

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