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1 **Highly Efficient and Recyclable Graphene Oxide-Magnetite Composites for**
2 **Isatin Mineralization**

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11 **ABSTRACT:** A series of graphene oxide-magnetite (GO-Fe₃O₄) composites with
12 various GO/Fe₃O₄ weight ratios (i.e., GO/Fe₃O₄ = 1/20, 2/20, 3/20 and 4/20) was
13 successfully synthesized via chemical precipitation of Fe₃O₄ nanoparticles on GO
14 sheets. The chemical and physical properties of as-synthesized GO-Fe₃O₄ composites
15 were characterized by XRD, TEM and FT-IR. Results from XRD and TEM revealed
16 that cubic-phase Fe₃O₄ was *in situ* deposited on the surface of GO resulting in
17 GO-Fe₃O₄ composites. The C-O-Fe bridging coordination mode was determined by
18 FT-IR, demonstrating the Fe₃O₄ nanoparticles were well coupled with GO sheets by
19 coordination bond. TEM images revealed that two types of geometrical structures of
20 GO-Fe₃O₄ composites were formed by loading different amounts of GO. With low
21 GO loadings (i.e., GO/Fe₃O₄ = 1/20, 2/20 and 3/20), a single layer structure
22 GO-Fe₃O₄ composite was obtained. At a high GO loading (i.e., GO/Fe₃O₄ = 4/20),
23 stacking structure of GO-Fe₃O₄ composite was formed. The as-prepared GO-Fe₃O₄
24 nanocomposites exhibited an excellent catalytic performance in the degradation of
25 isatin in the presence of H₂O₂. With GO/Fe₃O₄ weight ratio of 3/20, GO-Fe₃O₄
26 composites showed superior degradation efficiency of isatin, mainly due to the
27 effective functional combination between GO and Fe₃O₄.

28 **Keywords:** Graphene oxide; Magnetite; Catalytic; Isatin; Mineralization

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