## Growth of γ-Fe<sub>2</sub>O<sub>3</sub> nanosheet arrays on graphene for electromagnetic absorption applications

Yulan Ren, <sup>a</sup> Chunling Zhu, \*<sup>a</sup> Lihong Qi, <sup>b</sup> Hong Gao, <sup>c</sup> and Yujin Chen \*<sup>b</sup>

<sup>a</sup> Key Laboratory Superlight Materials and surface technology, Ministry of Education , and

College of Materials Science and Chemical Engineering, Harbin Engineering University, Harbin,

Heilongjiang,

<sup>b</sup> College of Science, Harbin Engineering University, Harbin 150001, China

<sup>c</sup> Key Laboratory for Photonic and Electric Bandgap Materials, Ministry of Education, Harbin

Normal University, Harbin, 150025, China



Figure S1 XRD pattern of G/ $\beta$ -FeOOH nanosheet arrays



Figure S2 SEM image of the sample obtained as the bare graphene sheets were added in the reaction system



Figure S3 XRD pattern of the 3D G/ $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> nanosheet arrays



**Figure S4** Fe2p core level XPS spectrum of the 3D G/γ-Fe<sub>2</sub>O<sub>3</sub> nanosheet arrays



Figure S5 Raman spectrum of the 3D  $G/\gamma$ -Fe<sub>2</sub>O<sub>3</sub> nanosheet arrays



Figure S6 Nitrogen adsorption and desorption isotherms of the 3D G/y-Fe<sub>2</sub>O<sub>3</sub> nanosheet arrays



**Figure S7** Tangent losses of the 3D  $G/\gamma$ -Fe<sub>2</sub>O<sub>3</sub> nanosheet arrays