Supporting Information

In situ Preparation, Characterization, Magnetic and Catalytic Studies of Surfactant Free RGO/ Fe$_x$Co$_{100-x}$ Nanocomposites

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Figure S1. (A, B) TEM image GO nanosheets. (C) High-resolution TEM iamge of GO. (D) (E) AFM images and cross-section analysis of GO, (F) XPS spectrum of graphene oxide (GO)

Fig. S2-1 EDX of RGO/Fe nanocomposites.
**Fig. S2-2** EDX of RGO/Fe$_{75}$Co$_{25}$ nanocomposites.

**Fig. S2-3** EDX of RGO/Fe$_{50}$Co$_{50}$ nanocomposites.
**Fig. S2-4** EDX of RGO/Fe<sub>25</sub>Co<sub>75</sub> nanocomposites.

**Fig. S2-5** EDX of RGO/Co nanocomposites.
**Fig S3.** The catalysts were magnetically separated from the solution.

**Fig S4** TEM image of RGO/FexCo100-x nanocomposites after catalyst reaction of 4-AP: (A) RGO/Fe, (B) RGO/Fe_{25}Co_{75}, (C) RGO/Fe_{50}Co_{50}, (D) RGO/Fe_{75}Co_{25} and (E) RGO/Co.