Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

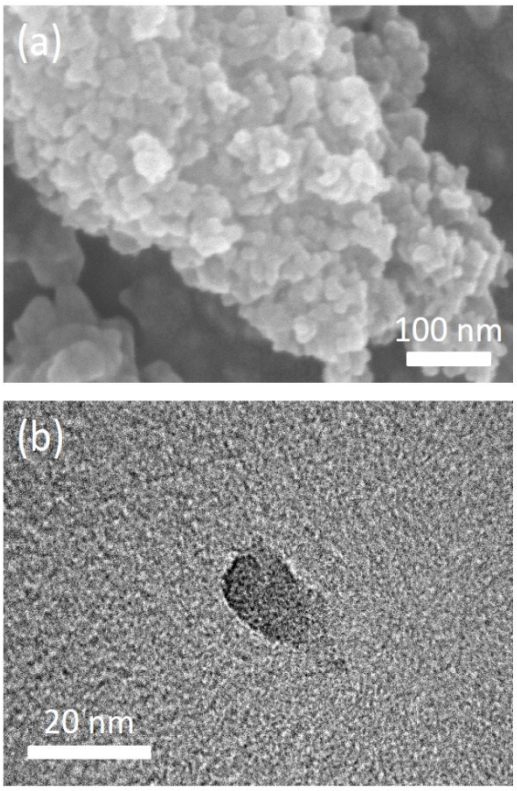

Fig. S1 (a) SEM and (b) TEM images of PB nanoparticles used in this study.

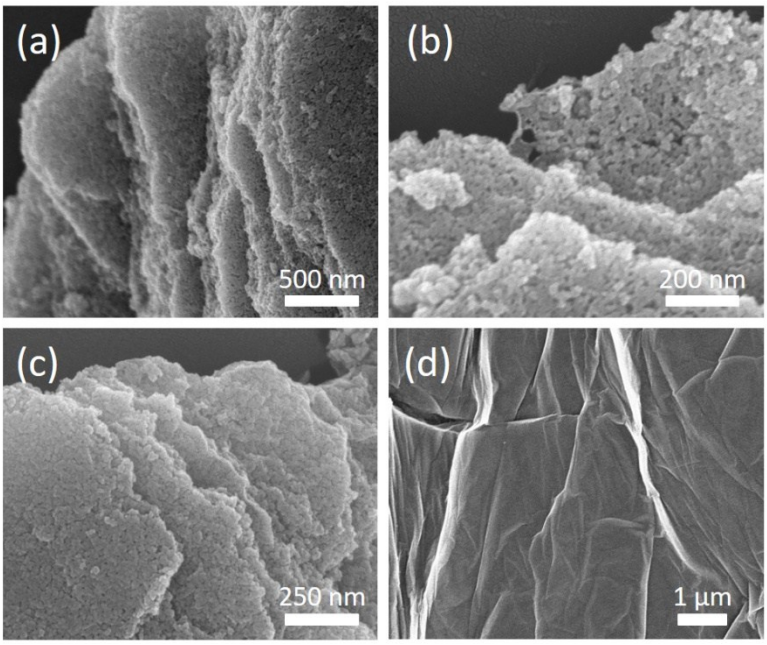

Fig. S2 SEM images of the un-calcined samples prepared with various GO:PB ratios [The GO:PB ratios are (a) 25:75, (b) 50:50, (c) 75:25, and (d) 100:0, respectively].

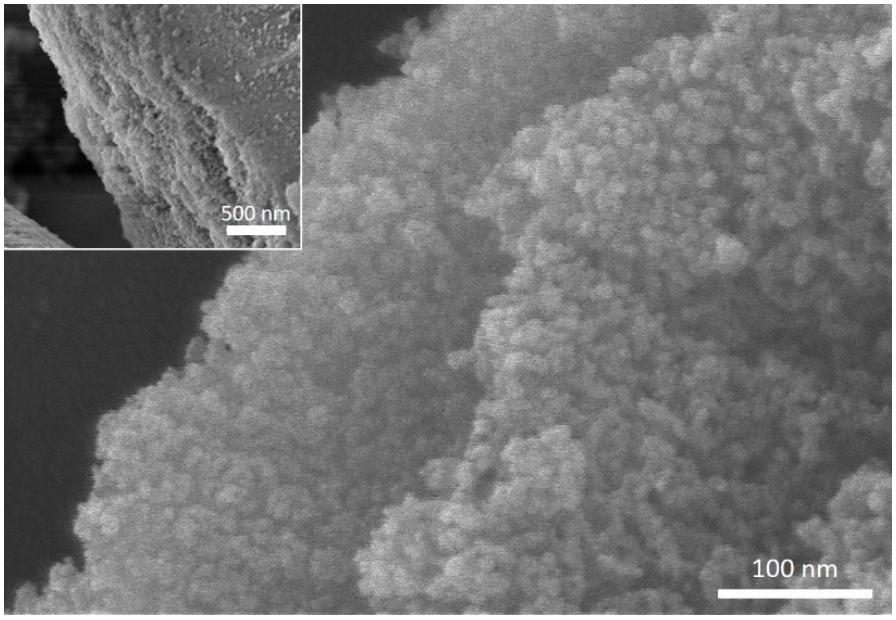

Fig. S3 SEM image of the GO/IO hybrid prepared from the thermal treatment of the GO/PB sample (GO:PB=25:75) at 400 °C in air.

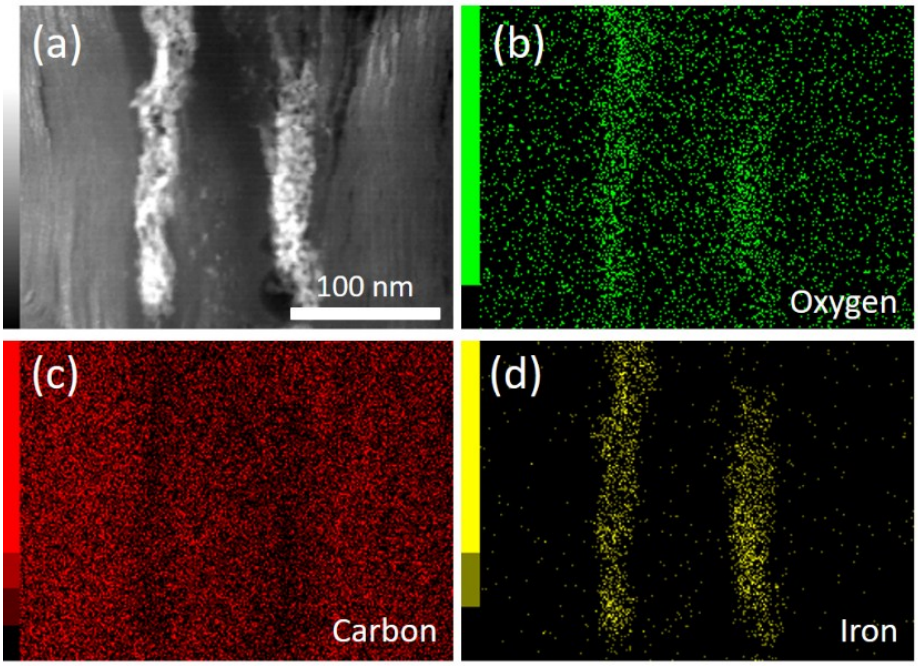

Fig. S4 The cross-sectional (a) HAADF-STEM image and (b-d) TEM elemental mapping images of the GO/IO hybrid prepared from the thermal treatment of the GO/PB sample (GO:PB =25:75) at 400 °C in air.

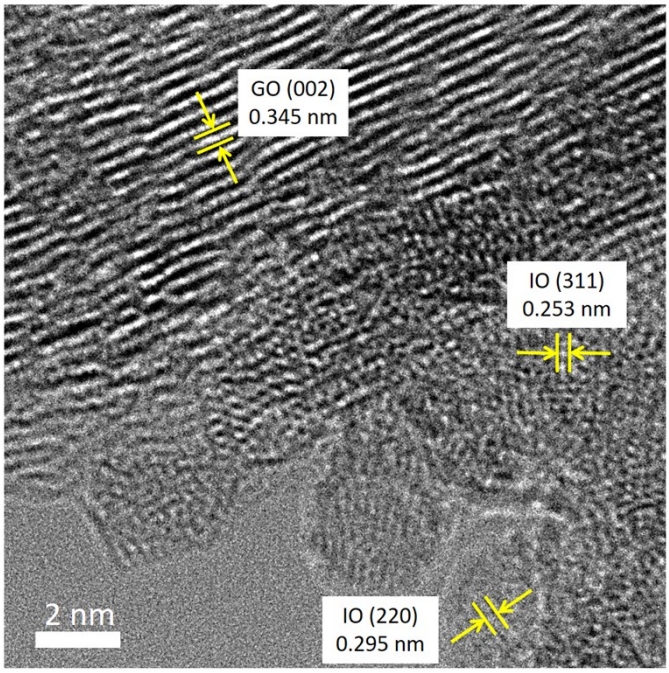

Fig. S5 High-resolution TEM (HRTEM) image of the interface between GO and IO.

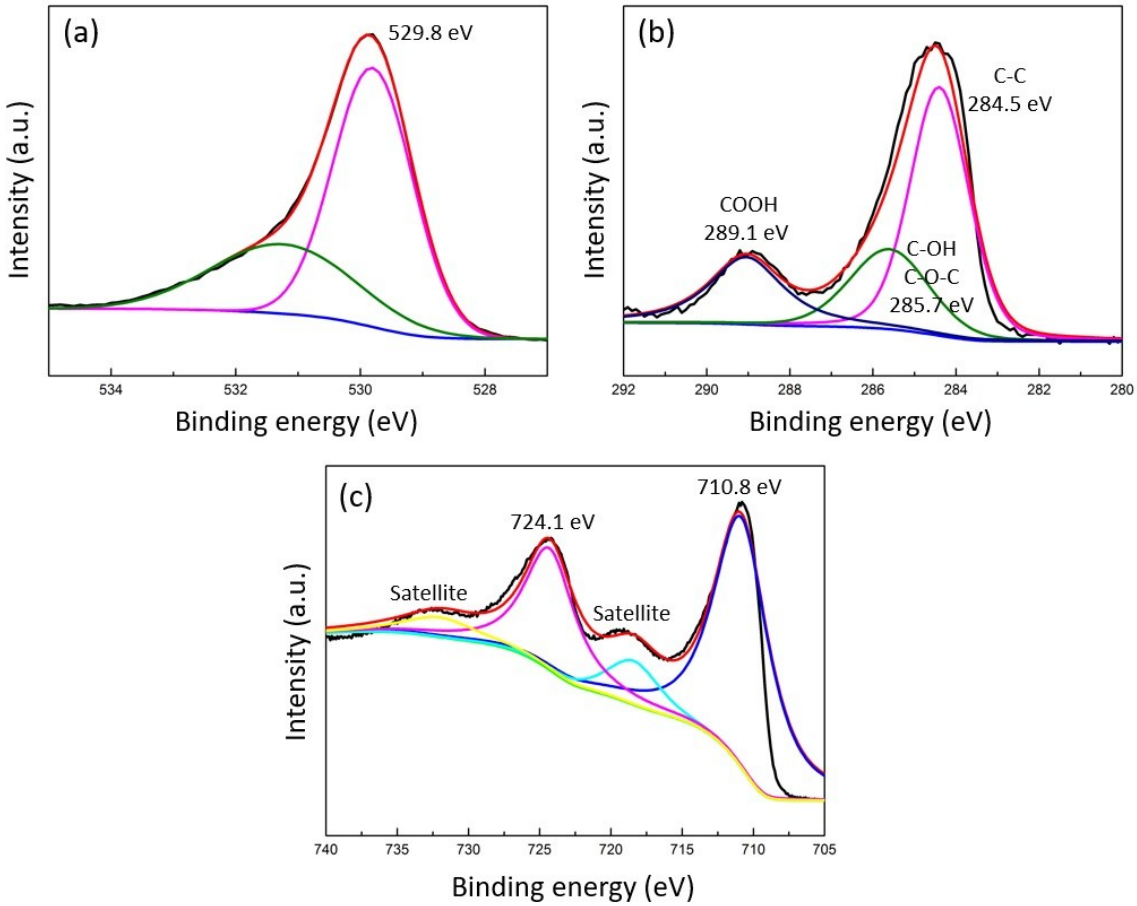

Fig. S6 High-resolution XPS spectra for (a) O 1*s*, (b) C 1*s* (c) Fe 2*p* orbitals of the GO/IO hybrid prepared from the thermal treatment of the GO/PB sample (GO:PB =25:75) at 400 °C in air.

Note: The O1s XPS peak appears at a binding energy of 529.8 eV, which shows the typical metal oxide state (**Fig. S6a**).[R1] Another peak at a higher binding energy can be attributed to the surface OH group.[R2] The C1s XPS peaks are deconvoluted to 284.5 eV (C-C), 285.7 eV (C-OH, C-O-C), and 289.1 eV (COOH), respectively (**Fig. S6b**).[R2] The two Fe 2*p* XPS peaks at 710.8 and 724.1 eV with two satellite peaks are indicative of the Fe^{3+} state, thus confirming the successful conversion of the initial PB to Fe_2O_3 (**Fig. S6c**).[R1]

[R1] S. Tanaka, B. P. Bastakoti,Y. Li, S. Yusa, D. Ishii, K. Kani, A. Fatehmulla, W. A. Farooq, M. A. A. Shiddiky, Y. Bando, Y. V. Kaneti, Y. Yamauchi, and M. S. A. Hossain, *Eur. J. Inorg. Chem.*, 2017, **2017**, 1328-1332.

[R2] W. K. Jo and N. C. S. Selvam, *Dalton Trans.* 2015, **44**, 16024-16035.