Electronic Supplementary Information (ESI)

Graphene-Wrapped Hierarchical TiO_2 Nanoflower Composite with Enhanced Photocatalytic Performance

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Characterization of materials using FTIR

FTIR was performed to investigate the functionality and interaction between TiO_2 and RGO. RGO shows peaks at 1718 cm^{-1} (C=O), 1577 cm^{-1} (skeletal vibration), 1399 cm^{-1} (C-OH), and 1246 cm^{-1} (C-O-C) (J. Mater. Chem. C, 2013, 1, 3104-3109). The TiO_2 materials share a common broad peak at ~3400 cm^{-1} (-OH) associated with the adsorption of water. The TiO_2 nanoflower also has a second peak at 1629 cm^{-1}, which is assigned to the binding vibration of the H-O bond (J Nanopart Res (2008) 10:729–736). The 0.05G-TiO_2 composite also shares this peak at 1617 cm^{-1}, however it is red shifted due to the presence of the skeletal vibration of RGO. The composite also has two small additional peaks at 1265 cm^{-1} and 1061 cm^{-1}, which can be assigned to the C-O-C and C-O stretching vibration of RGO. Therefore, although other groups have reported Ti-O-C peaks at 1738, 1260, 1096, and 798 cm^{-1} (Angew. Chem. Int. Ed., 2003, 42, 4908-4911, Turk. J. Chem. 2005, 29, 487) which are also seen in our results, based on our data it is difficult to confirm the presence of this interaction due to their strong similarity to vibrational modes of RGO.

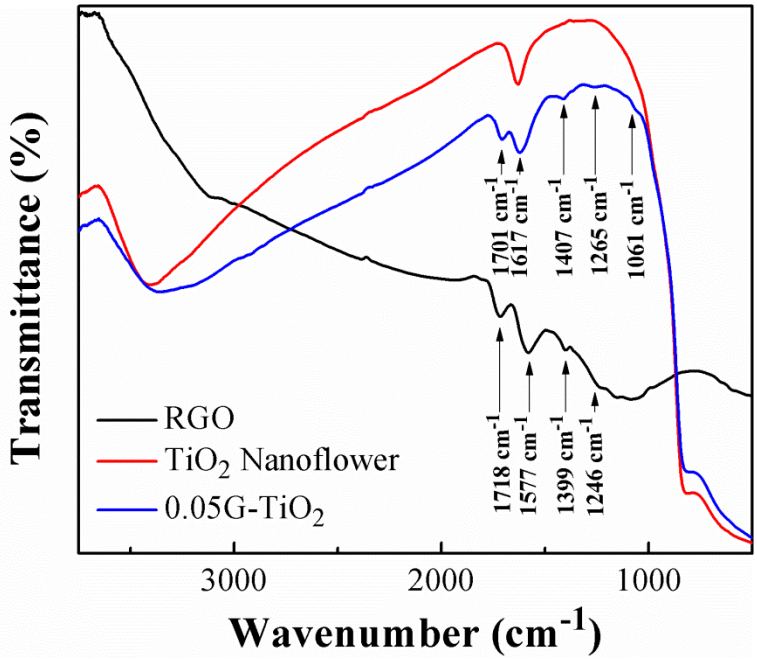

Fig. S1 FTIR spectra of RGO, TiO_2 Nanoflower, and 0.05G-TiO_2.