Electronic Supplementary Information

Constructing aligned γ-Fe_2O_3 nanorods with internal void space anchored on reduced graphene oxide nanosheets for excellent lithium storage

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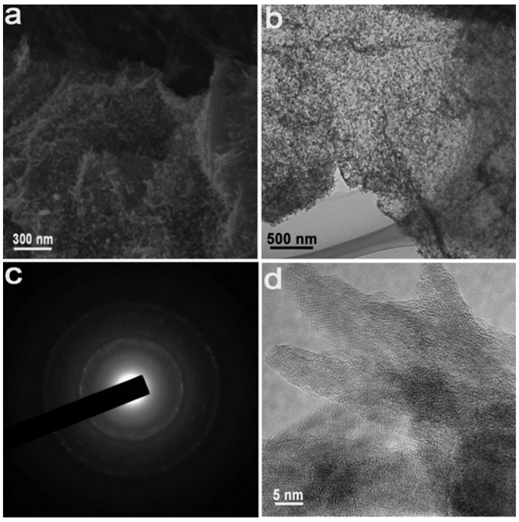

Fig. S1 (a) FESEM image, (b-d) TEM, SAED pattern and HRTEM images of the as-prepared precursor.

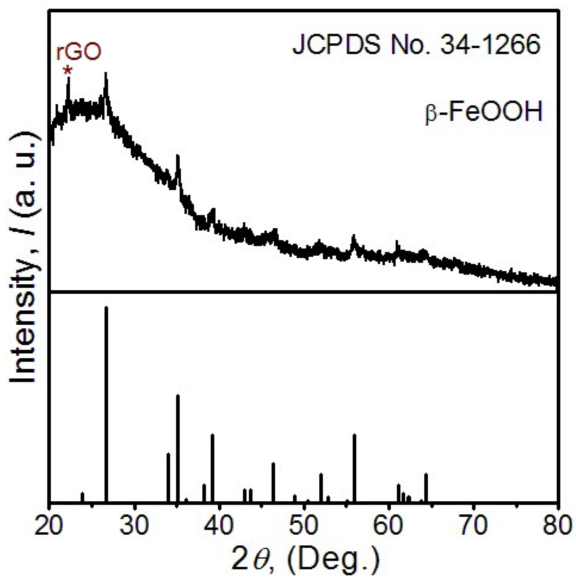

Fig. S2 XRD pattern of the as-prepared precursor.

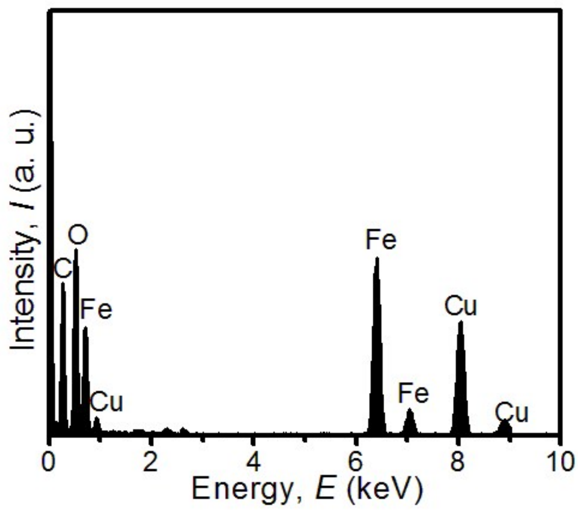

Fig. S3 EDX pattern of the γ-Fe_2O_3 IVS-NRs/rGO nanocomposites.

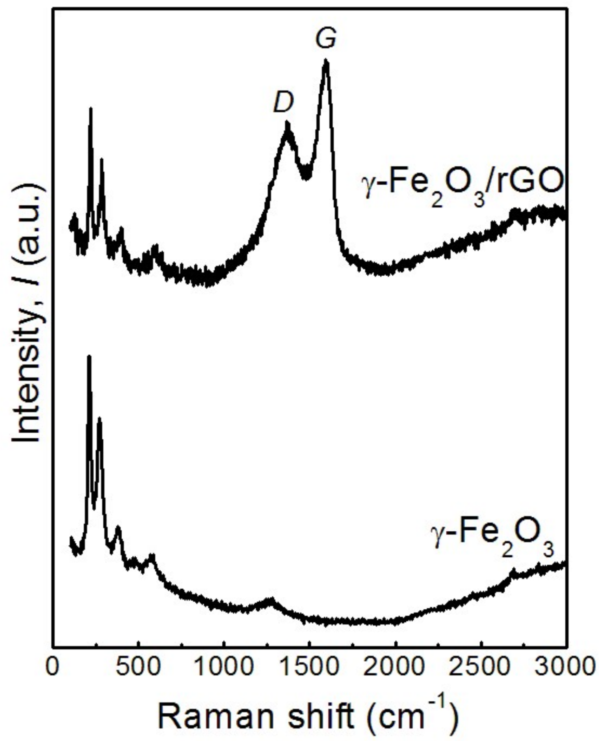

Fig. S4 Raman spectra for the γ-Fe_2O_3 IVS-NRs/rGO nanocomposites and commercial γ-Fe_2O_3 nanopowders.

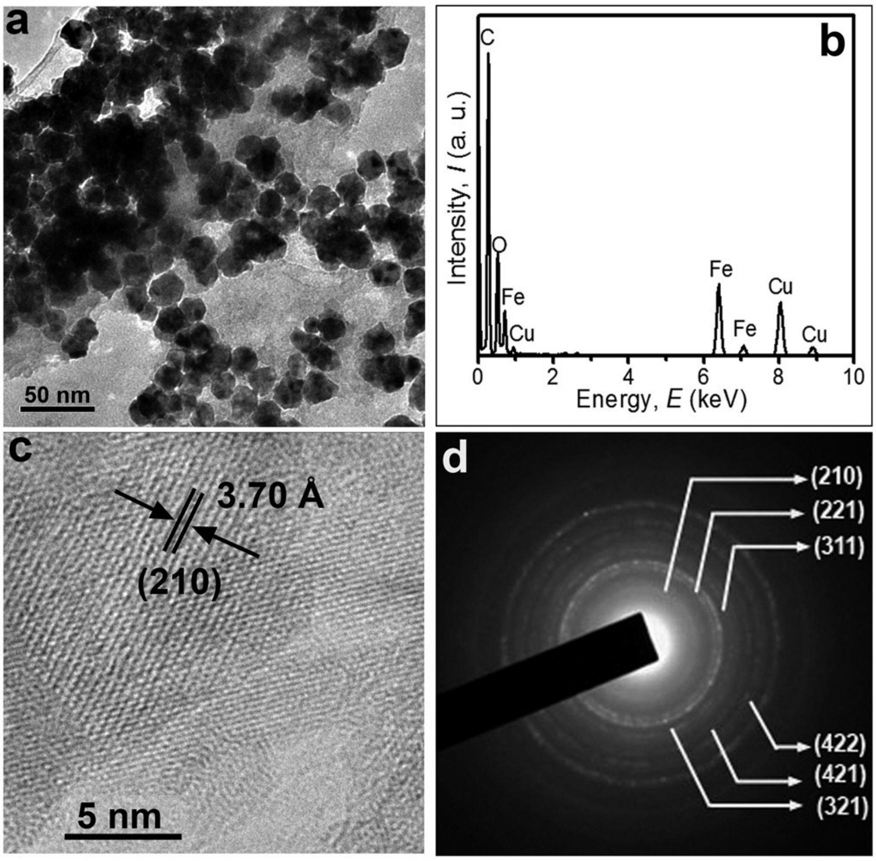

Fig. S5 TEM characterizations of commercial γ-Fe_2O_3 nanoparticles. The particles possess spherical morphology with an average diameter of ~20 nm. EDX result shows that the particles are composed of Fe and O with an atomic ratio of ~2:3. From the HRTEM image, the lattice spacing of d ~3.70 Å is determined, which corresponds to the (210) plane of cubic γ-Fe_2O_3. The diffraction rings of SAED pattern can also be assigned to the planes of γ-Fe_2O_3.

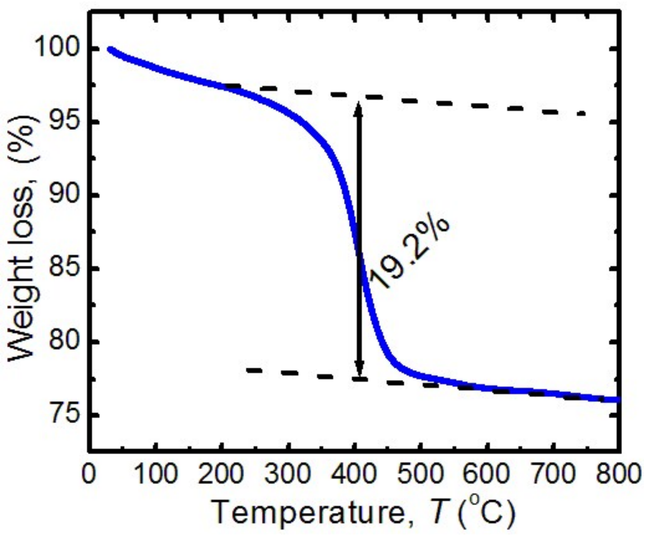

Fig. S6 TG curve of the γ-Fe_2O_3 IVS-NRs/rGO nanocomposites measured by using TG 2050 thermogravimetric analyzer under an air atmosphere at the temperature range of 25-800 °C with a heating rate of 10 °C min^{-1}. The weight loss before 300 °C could be ascribed to surface water adsorption, while the weight loss after ~300 °C could be ascribed to the oxidation of graphene in the nanocomposites, which yielding the weight fraction of rGO in the nanocomposites of about 19.2%.

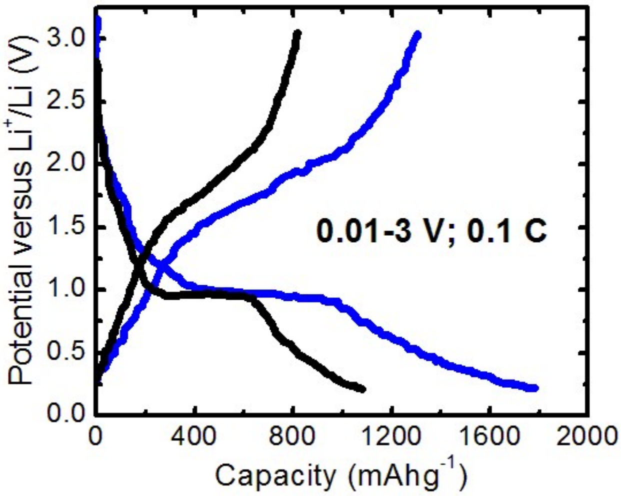

Fig. S7 Charge/discharge curves of the first cycle for the γ-Fe_2O_3 IVS-NRs/rGO nanocomposites (blue line) and commercial γ-Fe_2O_3 nanopowders (black line) electrodes between 0.05 and 3 V versus Li/Li^+ at a current density of 0.1 C.

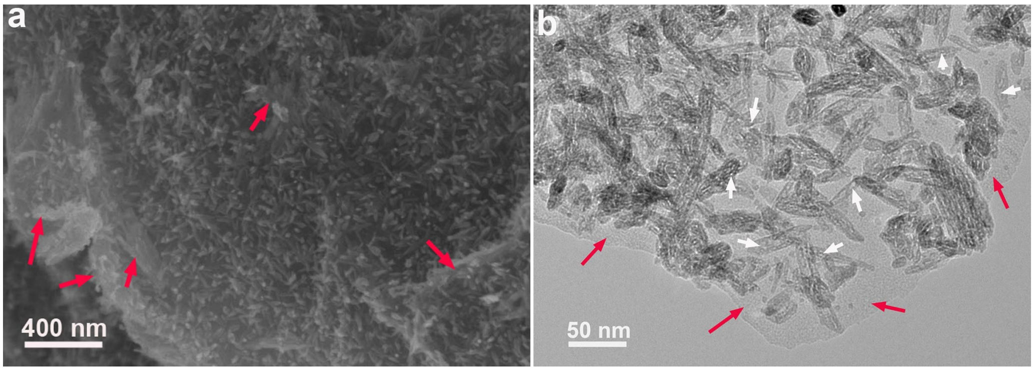

Fig. S8 (a) SEM and (b) TEM images of the γ-Fe_2O_3 IVS-NRs/rGO nanocomposites electrode after cycling performance testing (50 cycles, current rate 0.1 C, 0.01-3 V versus Li/Li^+).