Supporting Information

Dwindling the Re-stacking by Simultaneous Exfoliation of Boron Nitride and Decoration of α-Fe_2O_3 Nanoparticles using Solvothermal Route

Pitchai Thangasamy[a,b] and Marappan Sathish[a,b*]

[a]Academy of Scientific and Innovative Research, Karaikudi-630 003, Tamil Nadu, India.

[b]Functional Materials Division, CSIR-Central Electrochemical Research Institute, Karaikudi-630 003, Tamil Nadu, India.

*Corresponding author: marappan.sathish@gmail.com and msathish@cecri.res.in

Structural characterization:

The formation of α-Fe_2O_3 and BN-Fe_2O_3 composite was primarily characterized by XRD analysis. XRD patterns were recorded using BRUKER D8 ADVANCE X-ray Diffractometer with Cu Kα radiation (α = 1.5418 Å) from 10-80° at 0.02° step and a count time of 0.2s. FT-IR and Raman analysis was performed using TENSOR 27 spectrometer (Bruker) and laser Raman system (RENISHAW Invia laser Raman microscope) with He-Ne laser (wavelength λ = 633 nm), respectively. Diffuse reflectance spectra (DRS) was carried out using a UV-VIS-NIR double beam spectrophotometer (VARIAN, Cary 5000) equipped with a diffuse reflectance attachment. The decoration of α-Fe_2O_3 nanoparticles over E-BN nanosheets were evaluated by scanning electron microscopy (SEM) and high resolution transmission electron microscopy (HR-TEM) analysis. SEM and HR-TEM images were taken at different locations/magnifications using Hitachi S-3000H (Japan) with an accelerating voltage of 0.3–30 kV and Tecnai G^2 20 working at an accelerating voltage of 200 kV, respectively.

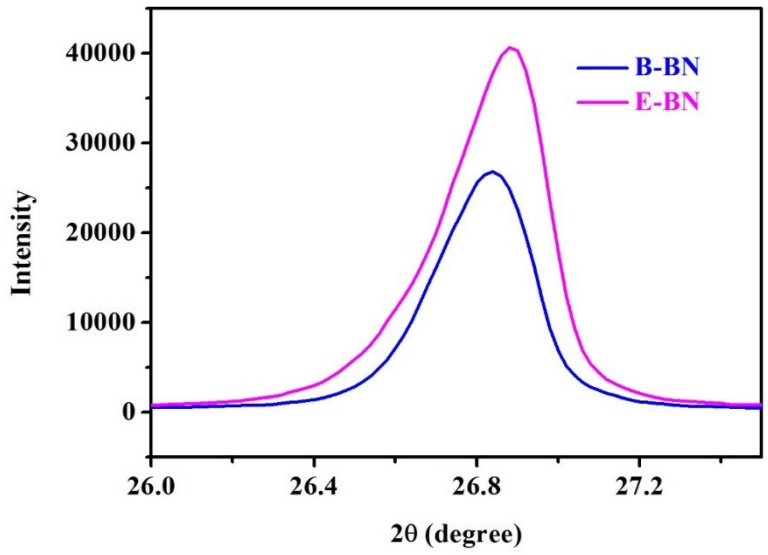

Fig. S1 Enlarged XRD patterns of B-BN and E-BN.

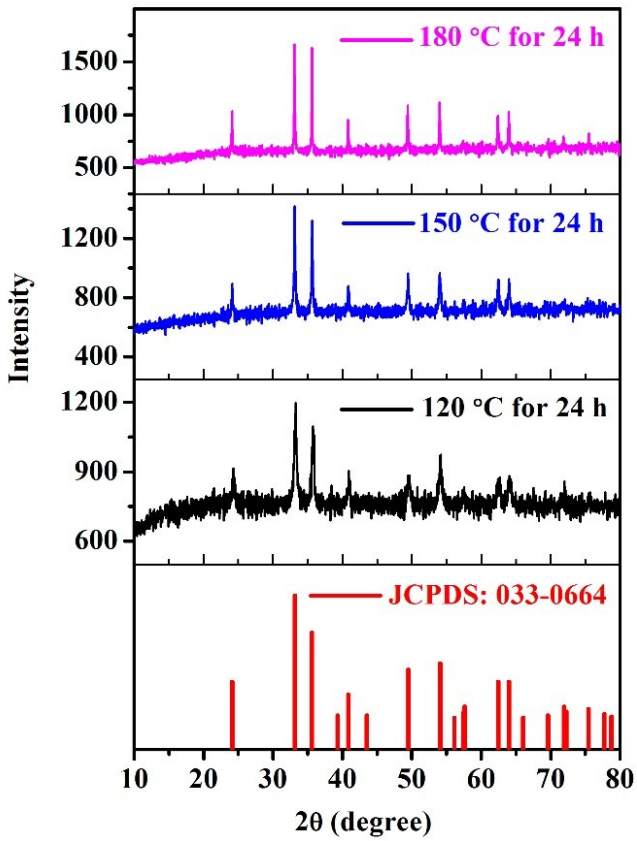

Fig. S2 XRD patterns of α-Fe_2O_3 nanoparticles obtained by different reaction temperatures and the standard reference pattern of α-Fe_2O_3.

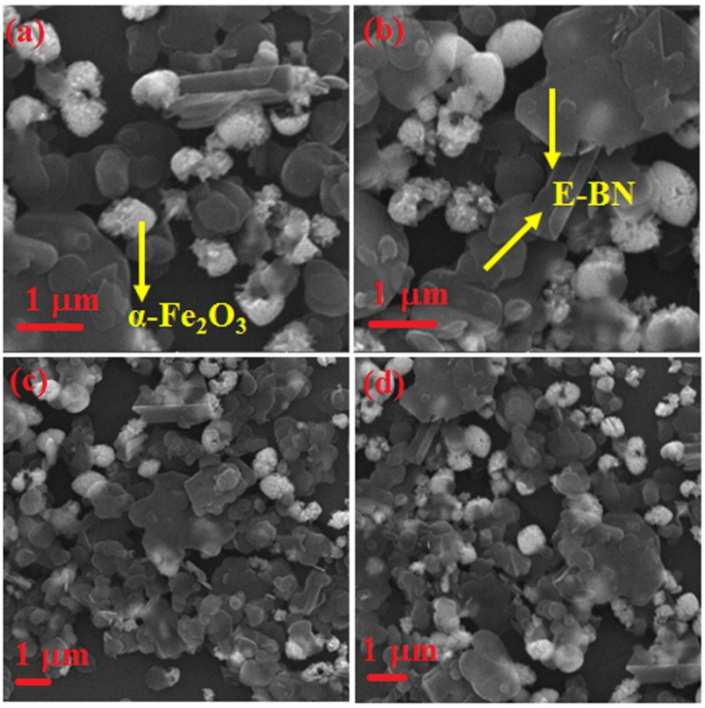

Fig. S3 SEM images of BN-Fe_2O_3 composite (1:1 wt%).

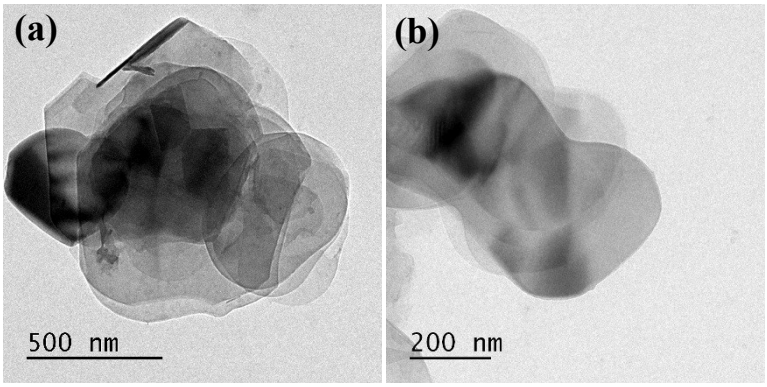

Fig. S4 HR-TEM images of E-BN nanosheets at different magnifications.

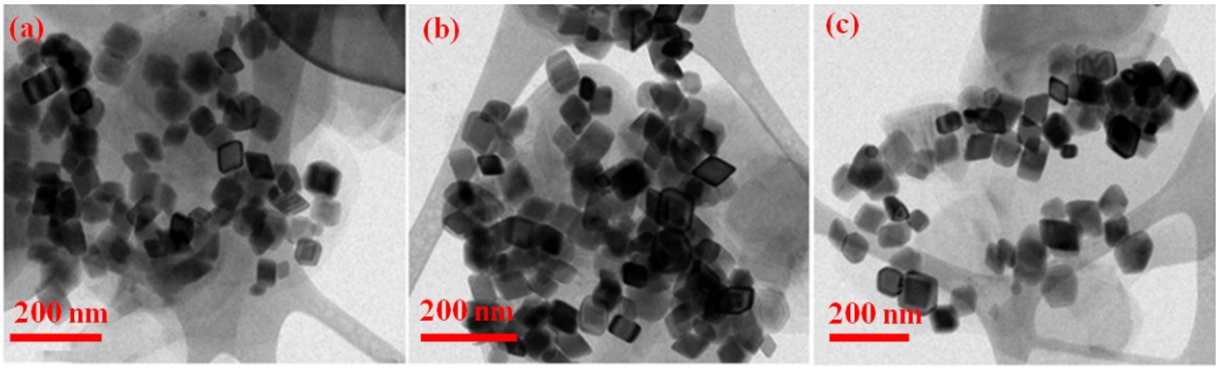

Fig. S5 HR-TEM images of BN-Fe_2O_3 composite.

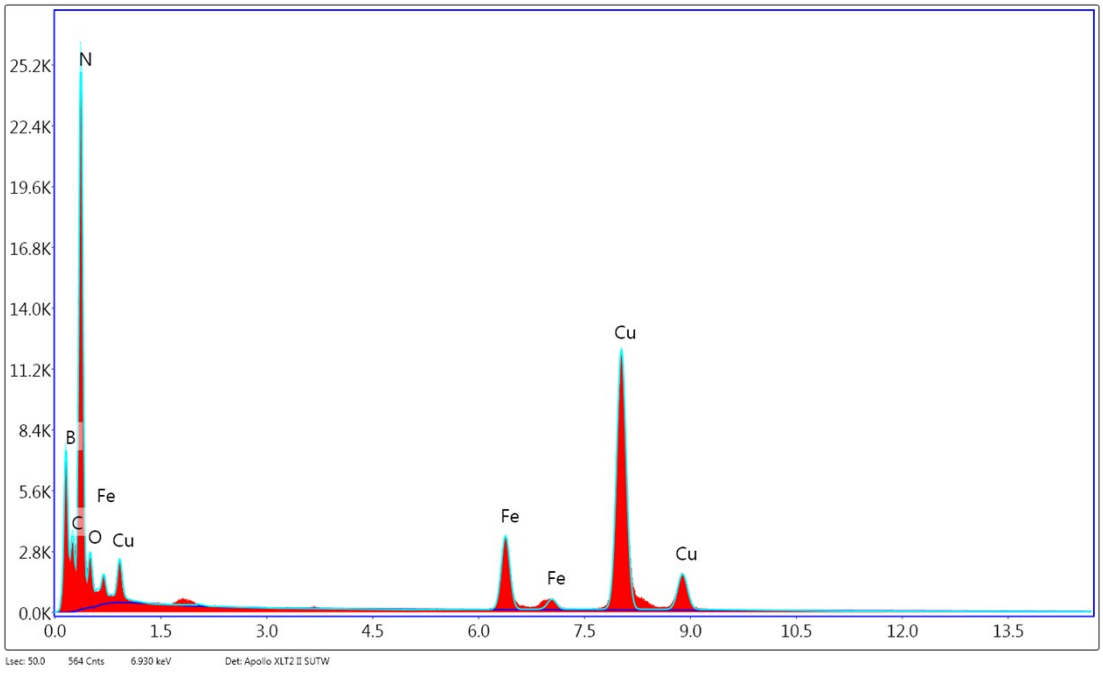

Fig. S6 TEM-EDX analysis of BN-Fe_2O_3 composite.

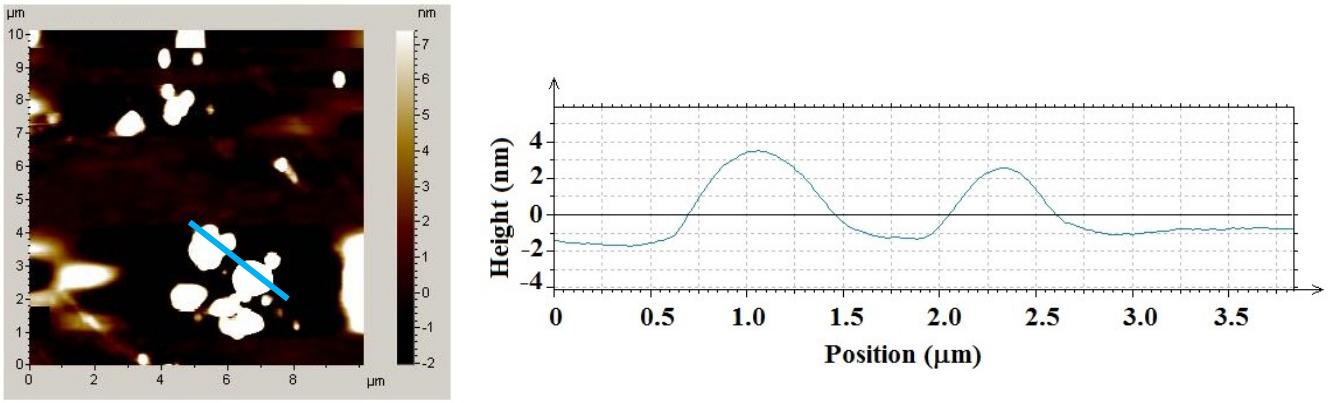

Fig. S7 AFM image of E-BN nanosheets.