Electronic Supplementary Information (ESI)

Hollow Spheres of Iron Oxide as an "Enzyme-mimic": Preparation, Characterization and Application as Biosensors

Balamurugan Thangavel,[$,‡] Sheela Berchmans[$,‡,*] and V. Ganesh[$,‡,*]

[$] Academy of Scientific and Innovative Research (AcSIR), Ghaziabad – 201002, India.

[‡] Electrodics and Electrocatalysis (EEC) Division, CSIR–Central Electrochemical Research Institute (CSIR–CECRI), Karaikudi – 630003, Tamil Nadu, India.

* To whom correspondence should be addressed:

E-mail: sheelaberchmans@yahoo.com ; vganesh@cecri.res.in ; ganelectro@gmail.com

Tel.: +91-4565-241242; Fax: +91-4565-227779

Figures:

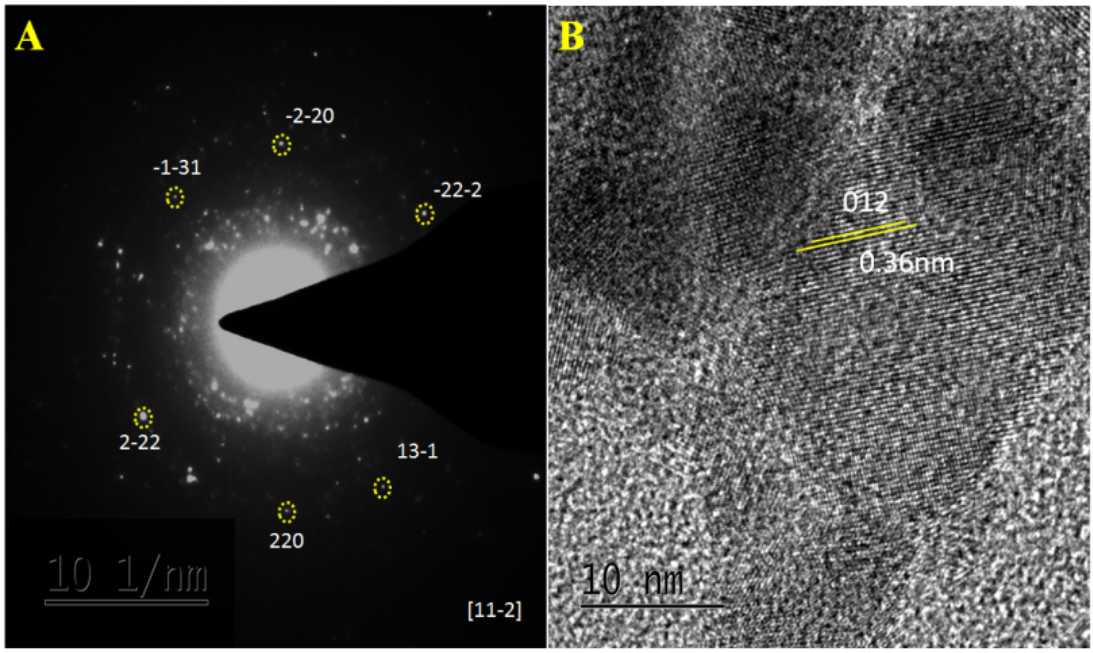

Figure S1: (A) Selected area electron diffraction and (B) diffraction fringes based TEM images of the synthesised $HSFe_2O_3$ nanoparticles.

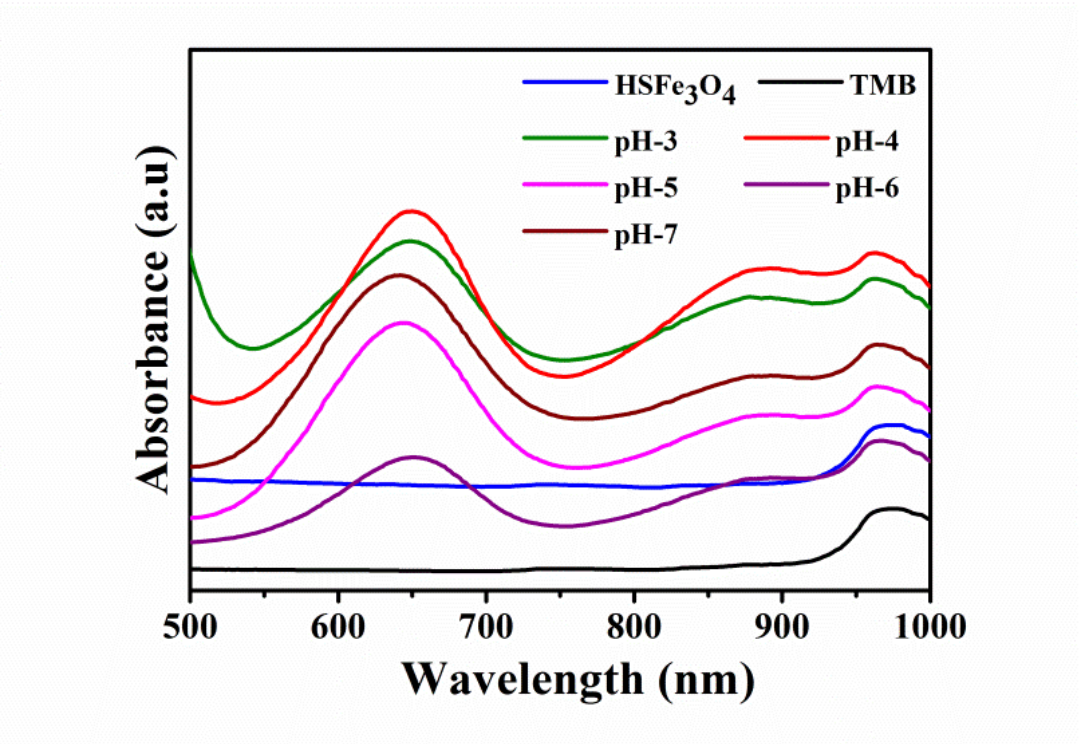

Figure S2: UV-visible spectra of TMB^{+} recorded at varied pH for peroxidase mimic assay.

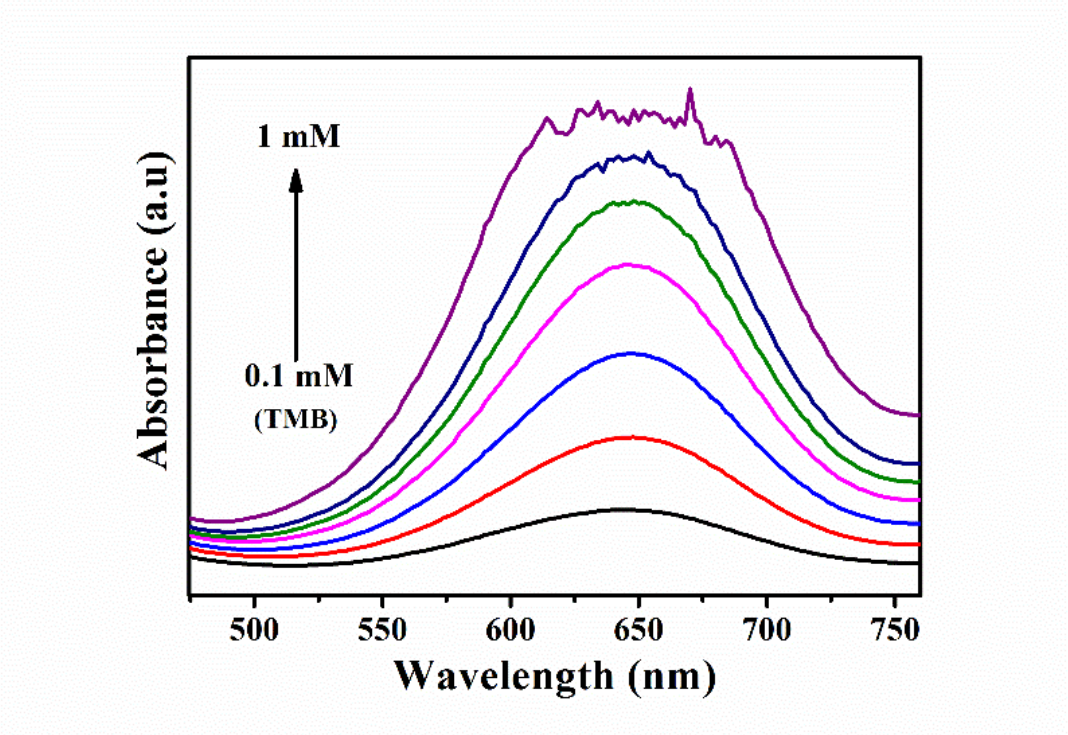

Figure S3: UV-visible spectra of peroxidase mimic assay recorded at varied TMB concentrations ranging from 0.1 mM to 1 mM. In this figure arrow indicates the direction of increasing concentration of TMB.

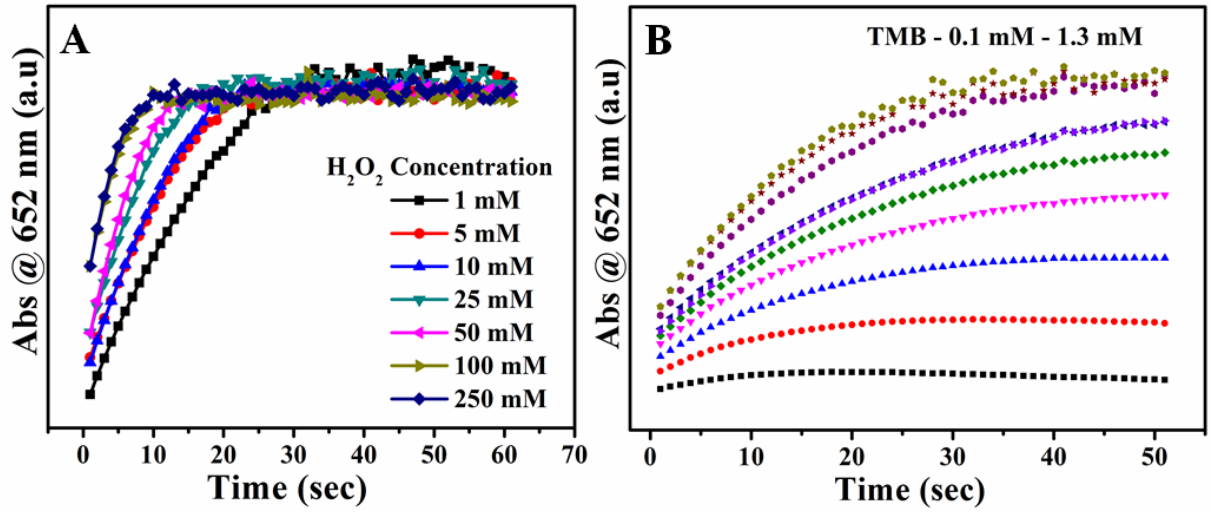

Figure S4: Time dependent UV-visible spectra of TMB – H_2O_2 system in presence of $HSFe_2O_3$ (25 µg) and the corresponding absorbance values were measured at 652 nm. (A) TMB – 1 mM; H_2O_2 is varied from 1 mM to 250 mM and (B) H_2O_2 – 1 M; TMB is varied between 0.1 mM and 1.3 mM.

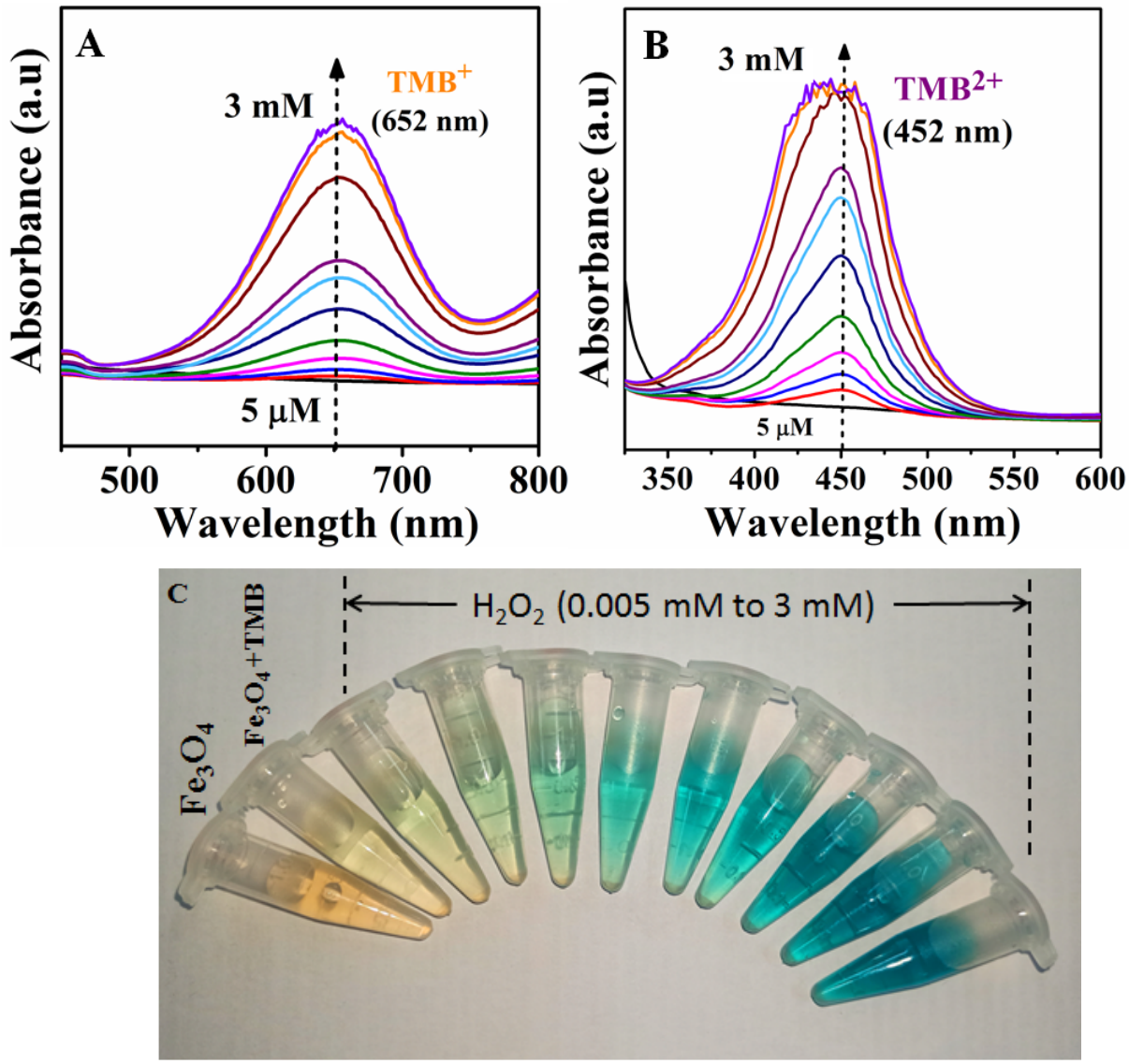

Figure S5: (A) and (B) UV-visible curves of TMB – H_2O_2 system in presence of $HSFe_2O_3$ (25 µg) and TMB – 1 mM by varying H_2O_2 concentrations (from 5.0 µM to 3.0 mM). (A) 2 minutes reaction time; (B) After the reaction was arrested by adding H^+ (20 µL of HCl, 0.01 M). (C) Photographs displaying the formation of blue color demonstrating the peroxidase mimic nanozyme using $HSFe_2O_3$ in TMB – H_2O_2 system.

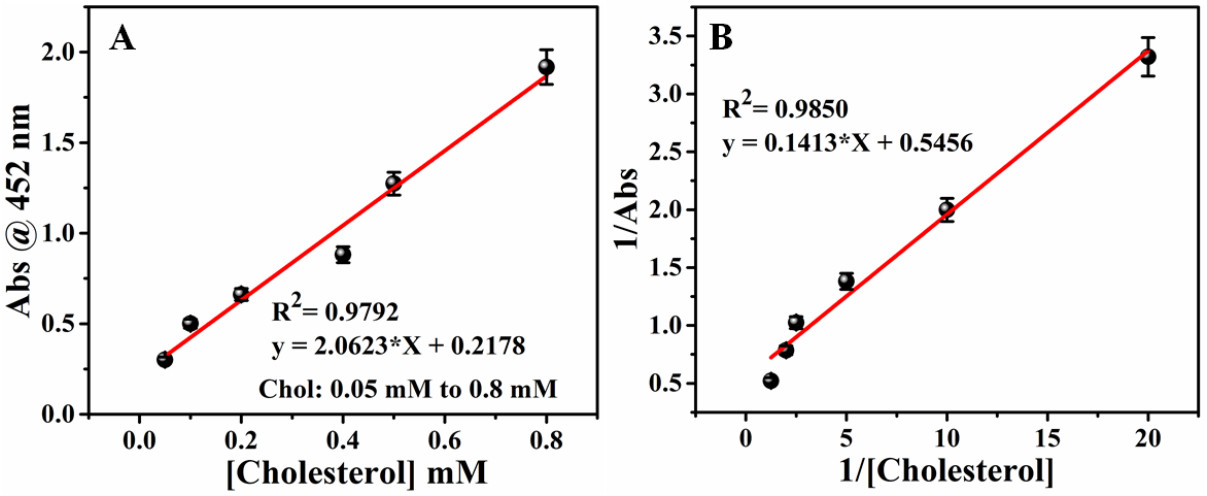

Figure S6: (A) UV-visible absorbance data recorded at 452 nm by varying the cholesterol concentration between 0.05 mM and 1.2 mM. (B) The calibration curves determined using Lineweaver–Burk equation. The error bars showed in this graph correspond to the standard deviation obtained from three independent measurements.