Electronic Supplementary information

Morphological tuning of Eu_2O_2S nanoparticles, manifestation of peroxidase-like activity and use in glucose assay

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Fig S1. FTIR spectra of single source precursor complex $[(Et_3NH)]^+[Eu(acda)_4]^-$.

Fig S2. UV-vis absorption spectra of precursor complex $[(Et_3NH)]^+[Eu(acda)_4]^-$.

Fig S3. Thermogravimetric analysis (TGA) of precursor complex $[(Et_3NH)]^+[Eu(acda)_4]^-$.

Fig S4. FTIR spectra of Eu_2O_2S nanoplate, nanosphere and rod-like nanoparticles.

Fig S5. Particle size distribution plot for Eu_2O_2S hexagonal nanoplate.

Fig S6. FESEM images of Eu_2O_2S nanoplate: (a) low magnification, (b) high magnification (Inset: hexagonal morphology is obtained in FESEM analysis.

Fig S7. Room temperature excitation spectra of Eu_2O_2S nanoparticles: (a) nanoplates, (b) nanosphere, (c) nanorod-like particles.

Fig S8. Time dependent Uv-vis spectral changes of TMB-H_2O_2 system catalyzed by Eu_2O_2S nanoplates. Inset: Change of color before and after the oxidation of TMB.

Fig S9. Effect of (a) pH and (b) temperature on the peroxidase like activity.

Fig S10. Steady-state kinetic study using the Michaelis-Menten model and Lineweaver-Burk model (insets) for commercially available Eu_2O_3 by (a) varying the concentration of H_2O_2 with fixed amount of TMB and (b) varying the concentration of TMB with fixed amount of H_2O_2.

Fig S11. The Effect of nanoparticles in the formation of hydroxyl radical with terephthalic acid as photoluminescence probe: in presence of (a) Eu_2O_2S and (b) Eu_2O_3

Fig S12. Selectivity test in glucose detection. Bar diagram for the spectrophotometric response of TMB at 653 nm in presence of glucose oxidase for the addition of (i) 0.5 mM glucose, (b) 5 mM fructose, (c) 5 mM maltose, (d) 5 mM lactose.

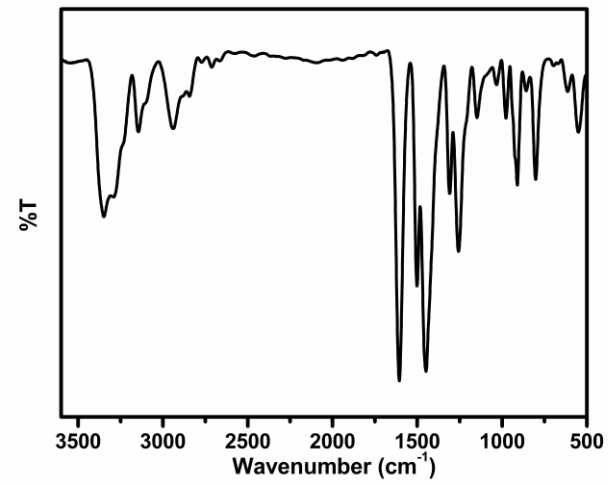

Fig. S1

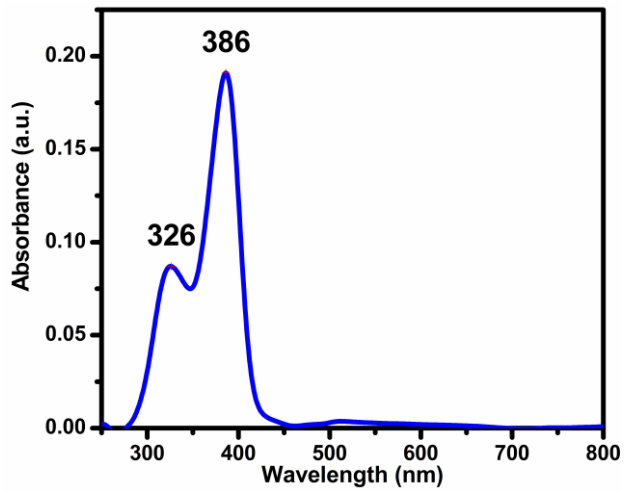
386
326
Absorbance (a.u.)
0.00
0.05
0.10
0.15
0.20
300
400
500
600
700
800
Wavelength (nm)

Fig. S2

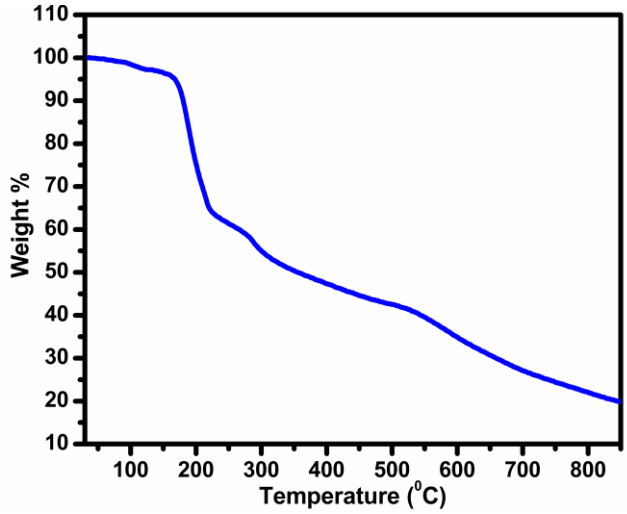
Weight %
10
20
30
40
50
60
70
80
90
100
110
100
200
300
400
500
600
700
800
Temperature (°C)

Fig. S3

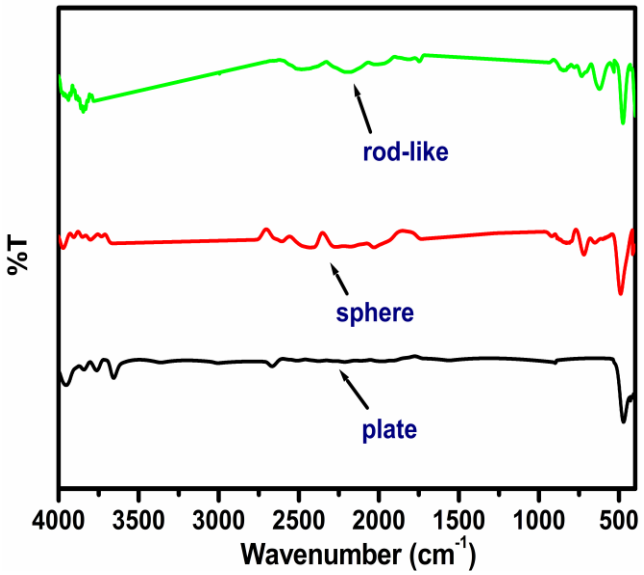
rod-like
sphere
plate
%T
4000 3500 3000 2500 2000 1500 1000 500
Wavenumber (cm-1)

Fig. S4

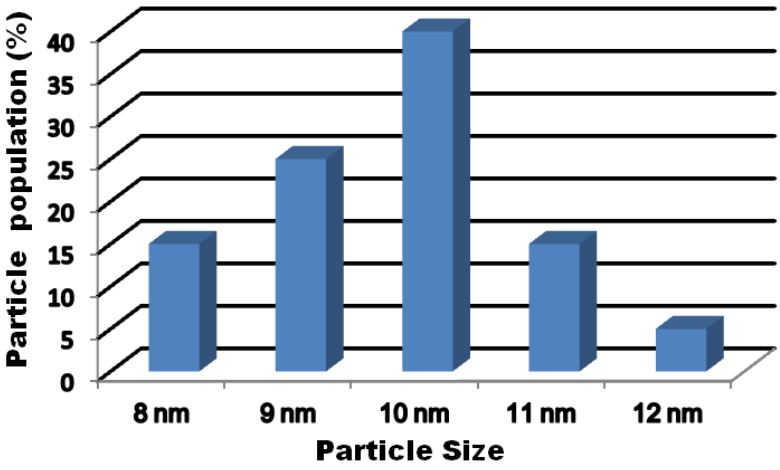
Particle population (%)
0 5 10 15 20 25 30 35 40
8 nm 9 nm 10 nm 11 nm 12 nm
Particle Size

Fig. S5

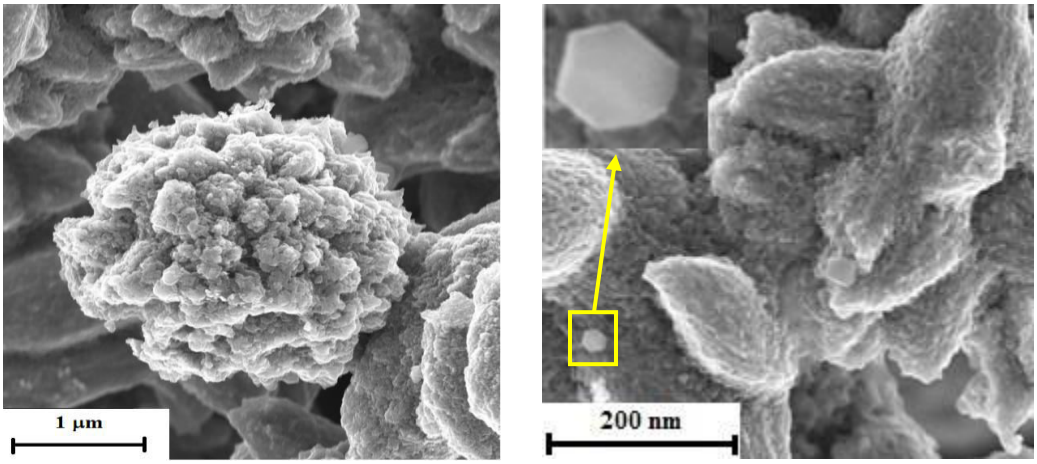
1 μm
200 nm

Fig. S6

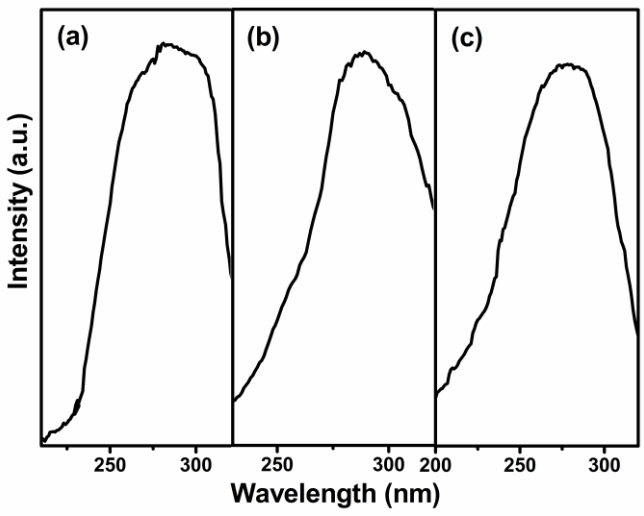
(a)
(b)
(c)
Intensity (a.u.)
250
300
250
300
200
250
300
Wavelength (nm)

Fig. S7

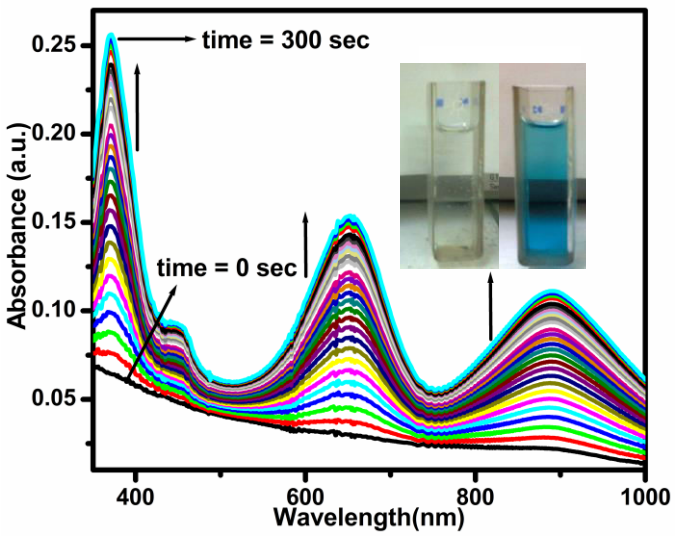
time = 300 sec
time = 0 sec
Absorbance (a.u.)
Wavelength(nm)
0.25
0.20
0.15
0.10
0.05
400
600
800
1000

Fig. S8

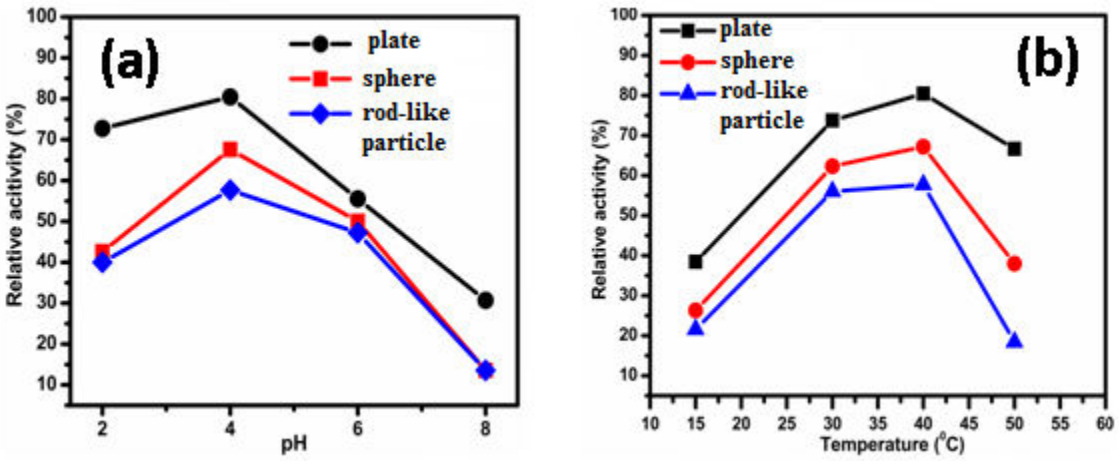
(a)
plate
sphere
rod-like particle
Relative acitivity (%)
pH
(b)
plate
sphere
rod-like particle
Relative activity (%)
Temperature (°C)

Fig. S9

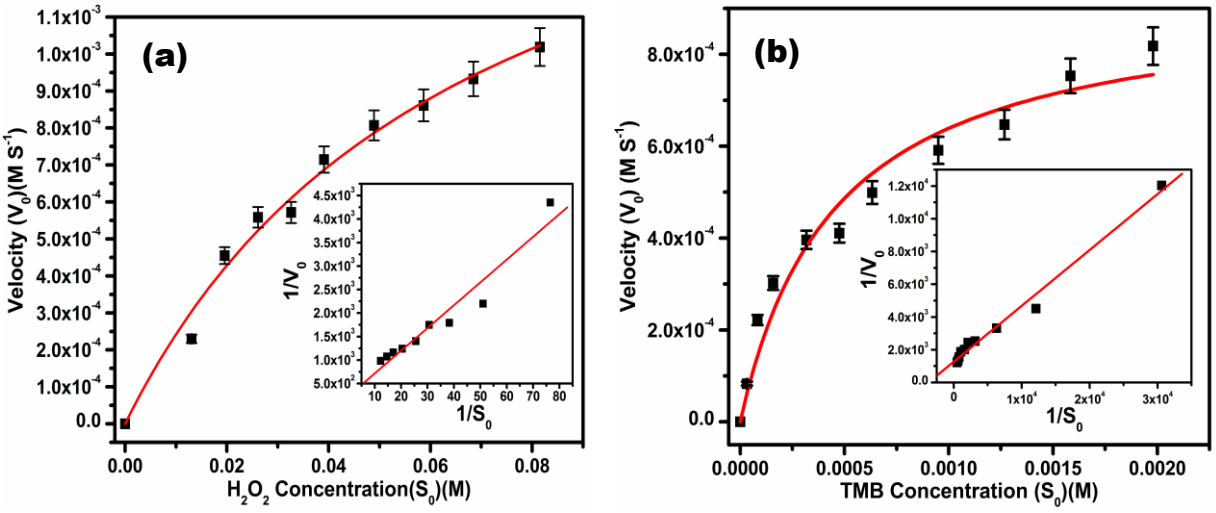

Fig. S10

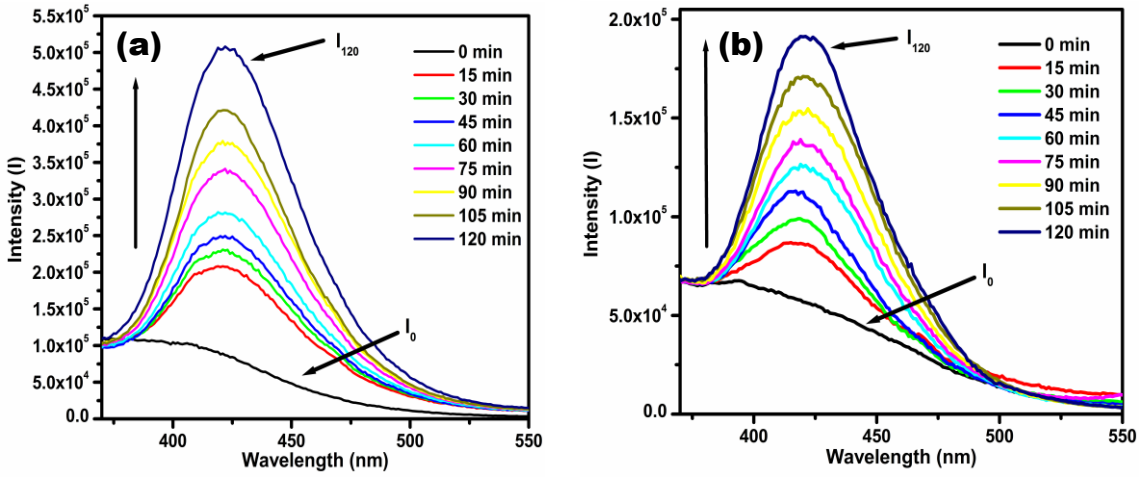

Fig. S11

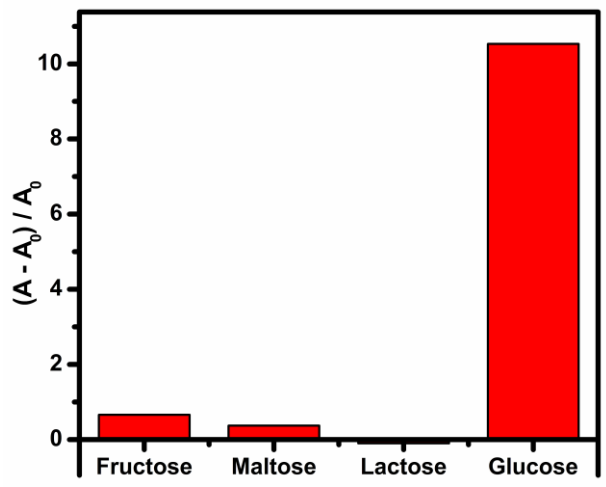

Fig. S12