

Supporting Information

Size-tuned hydrophilic cerium oxide nanoparticles as a ‘turn-on’ fluorescent sensor for the rapid detection of ultralow concentration vitamin C.

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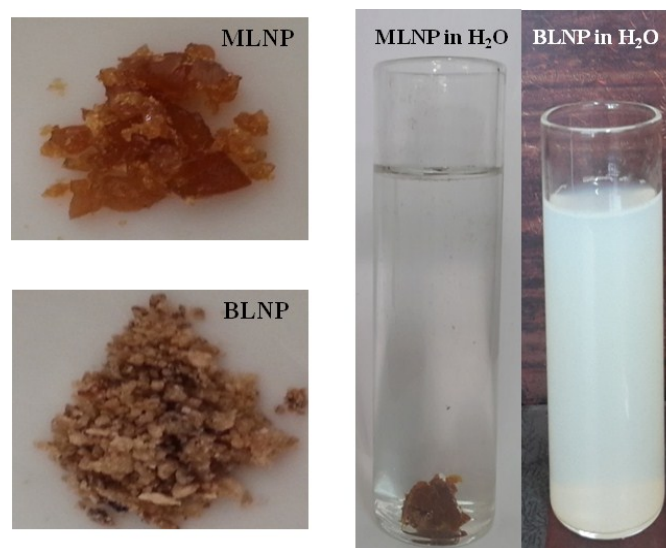


Fig. S1. Optical photographs of MLNP and BLNP and their interaction with water

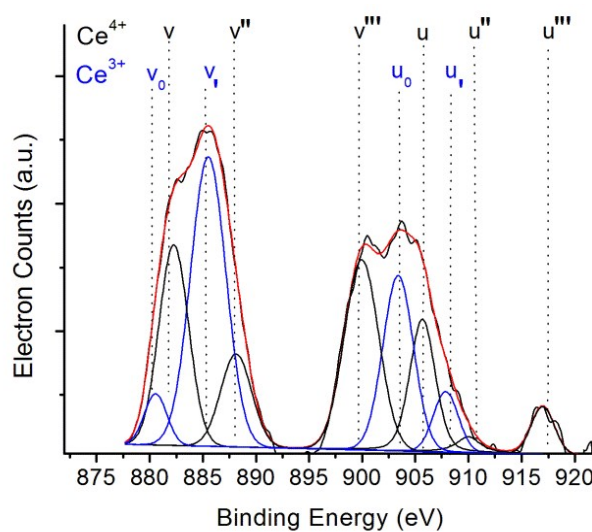


Fig. S2. X-ray photoelectron spectra (XPS) of Ce 3d core photoelectrons of BLNP.



Fig. S3. Visual change in the colour of BLNP dispersion to yellowish, after the addition of KMnO_4 , indicating oxidation of Ce^{3+} to Ce^{4+} .

Analysis of vitamin C in commercial pharmaceutical formulations

A solution of one tablet (Tablet 1) in water was prepared, which was made up to 1000 ml in a standard flask. 1ml aliquot was taken and again diluted to 1000 ml. 2 ml of this solution was added to 2 ml of the BLNP dispersion (0.0008 M) whose fluorescence has been quenched by the addition of permanganate and the PL intensity of the same has been monitored. Likewise for tablet 2, one tablet was dissolved in 1000ml water and 2ml of this was added to the fluorescence quenched BLNP dispersion. The quantification was carried out by deriving the concentration of vitamin C corresponding to the respective PL intensity from the linear calibration plot and subsequently its concentration in the parent solution (in each tablet) has been calculated. The experiment was conducted as triplicate and the final value was represented in terms of Relative standard deviation (RSD) as tabulated in Table S1.

Table S1. Summary of the quantitative estimation of vitamin C in commercial samples

Sample	Replicates	PL Intensity (a.u.)	Concentration of vitamin C from linear plot (μM)	Amount of vitamin C per tablet (mg)	Mean	Certified amount of vitamin C per tablet (mg)	SD	RSD (%)
Tablet 1	1	15.58	3.35	590	528	500	56.32	0.107
	2	14.76	2.92	514				
	3	14.31	2.73	480				
Tablet 2	1	19.11	5.06	0.89	0.98	1	0.09	0.092
	2	20.02	6.13	1.08				
	3	21.3	5.51	0.97				