## **Supporting Information**

A comprehensive study into the evaluation of non-conventional lanthanum phosphate nanospheres, inside a water-pool of reverse micellar scaffolds: employed in sensory assessment of surfactant free TiO<sub>2</sub> based Pickering emulsion formulation

Trishna Mandal<sup>a</sup>, Sk Mehebub Rahaman<sup>a\*</sup>, Bipasha Saha<sup>b</sup>, Nargis Khatun<sup>a</sup>, Arnab Patra<sup>a</sup>, Arnab Mukherjee<sup>c</sup>, Mahasweta Nandi<sup>b</sup>, Debasis Dhak<sup>c</sup>, Sanjay Roy<sup>d</sup>, Bidyut Saha<sup>a\*</sup>

<sup>a</sup>Colloid Chemistry Laboratory, Department of Chemistry, The University of Burdwan, Golapbag, Burdwan-713104, West Bengal, India; <u>bsaha@chem.buruniv.ac.in</u> and 9476341691 (B. Saha); <u>smrahaman@scholar.buruniv.ac.in</u> and 8016288873 (S.M. Rahaman).

<sup>b</sup>Integrated Science Education and Research Centre, Siksha Bhavana, Visva-Bharati University, Santiniketan-731235, India.

<sup>c</sup>Department of Chemistry, Sidho-Kanho-Birsha University, Purulia 723104, India.

<sup>d</sup>Department of Chemistry, School of Sciences, Kalyani Regional Centre, Netaji Subhas Open University, West Bengal, India.

## **Supplementary Material: Figures**

Fig. S1.



**Fig. S1.** Energy dispersive X-ray (EDX) and electron mapping analysis (after 60 min of reactions) of LaPO<sub>4</sub> nanospheres, synthesised from reverse micellar media of Tween 20/1-butanol/toluene/lanthanum phosphate.





Fig. S2. An unstable O/W Pickering emulsion, formed by only 0.05 wt.% of  $TiO_2$ .

Fig. S3.



**Fig. S3.** Digital photographs of Pickering emulsion stabilised by (a) different wt.% LaPO<sub>4</sub> nanospheres only, (b) 0.05 wt.% of LaPO<sub>4</sub> nanospheres with varying wt.% of TiO<sub>2</sub>, (c) 0.05 wt.% of TiO<sub>2</sub> with different wt.% LaPO<sub>4</sub> nanospheres, after 4 weeks of standings.

Fig. S4.



**Fig. S4.** Optical Micrographs of Pickering emulsion stabilized by different wt.% of LaPO<sub>4</sub>, *in situ* hydrophobized with a constant amount (0.05 wt.%) of TiO<sub>2</sub> nanoparticles after 2 hr of standings.

Fig. S5.



Fig. S5. Variation of droplets diameter of the prepared Pickering emulsion, stabilised by different wt.% of LaPO<sub>4</sub>, *in situ* hydrophobized with a constant amount (0.05 wt.%) of  $TiO_2$  nanoparticles after 2 hr of standings.