

Supporting Information

Hydrophobic Nanoparticles Promote Lamellar to Inverted Hexagonal Transition in Phospholipid Mesophases

Jennifer M. Bulpett,^a Tim Snow,^a Benoit Quignon,^a Charlotte M. Beddoes,^a T-Y. D. Tang,^a Stephen Mann,^a Olga Shebanova,^b Claire L. Pizzey,^b Nicholas J. Terrill,^b Sean A. Davis^a and Wuge H. Briscoe^{a†}

a. School of Chemistry, University of Bristol, Cantock's Close, Bristol BS8 1TS, UK

b. Diamond Light Source Ltd, Diamond House, Harwell Science and Innovation Campus, Didcot, OX11 0DE, UK

[†] Corresponding author; email: wuge.briscoe@bris.ac.uk; Ph: +44 (0)117 3318256

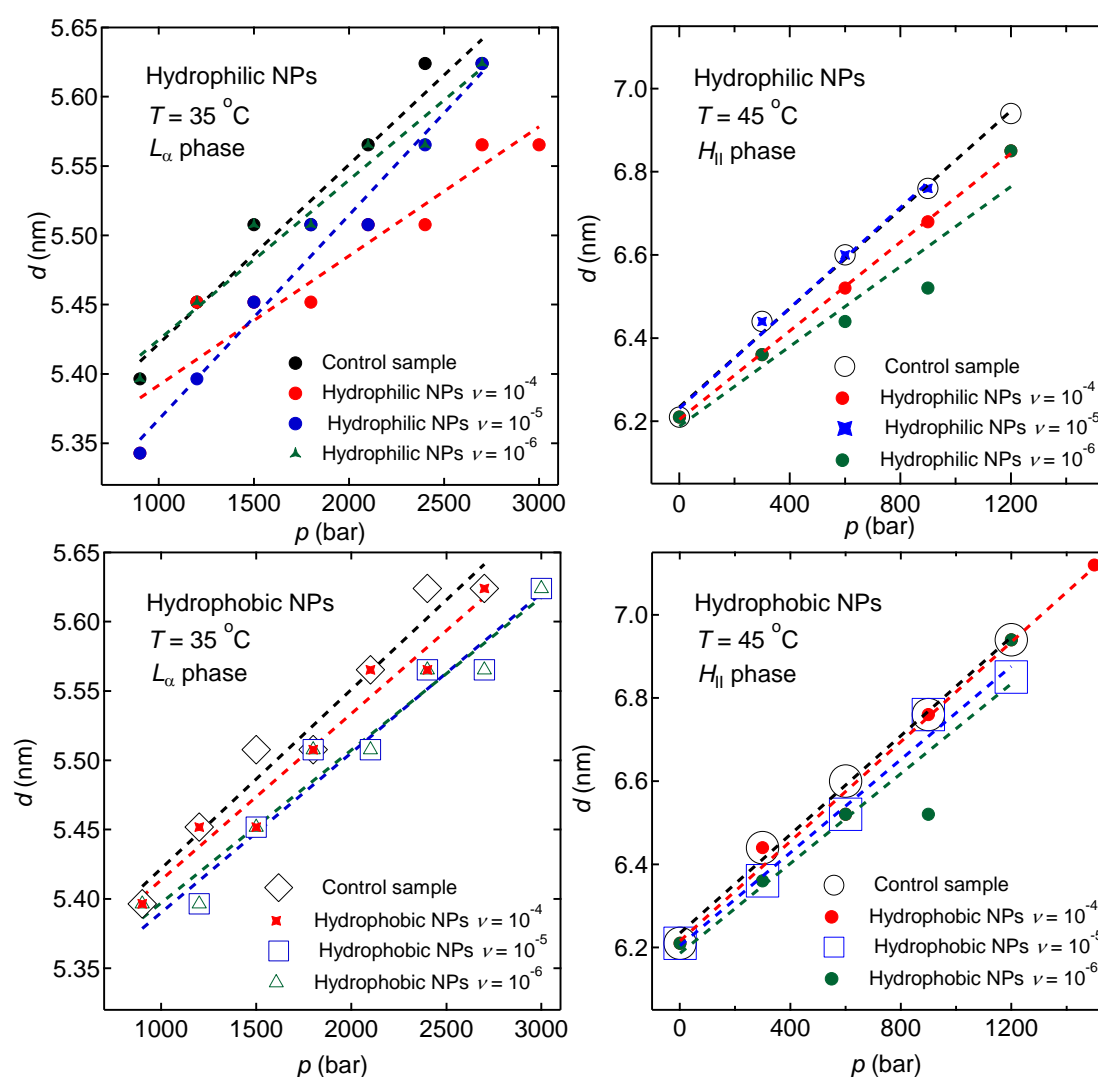


Figure S1. Pressure dependence of d -spacing of the L_α and H_{II} phases for the control sample (without NPs) and for the samples with hydrophilic NPs ((A) and (B)) and hydrophobic NPs ((C) and (D)). Both the full data sets and the linear fits to the data points are shown.

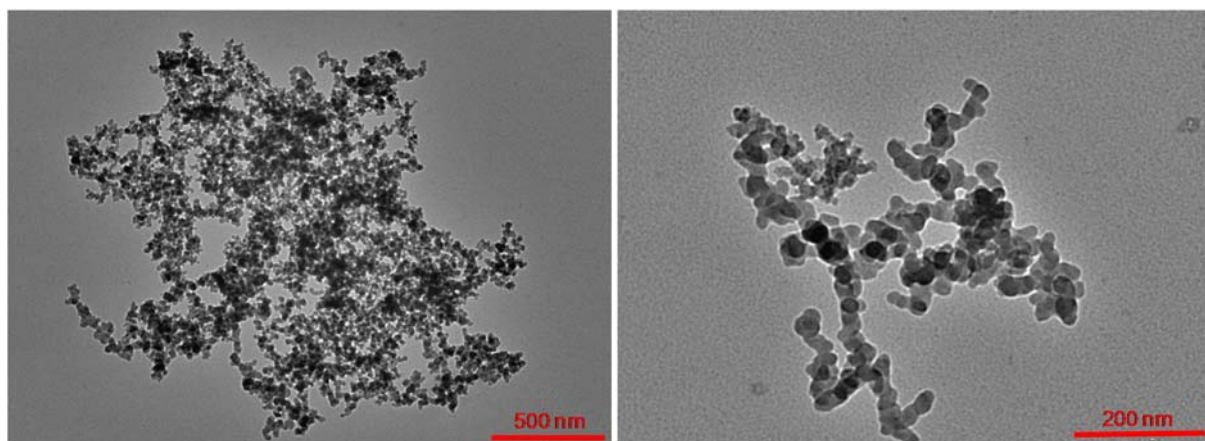


Figure S2. TEM images of hydrophobic SiO₂NPs (PlasmaChem). The quoted size is 14 nm, and the size distribution from TEM is shown to be in the range 14-19 nm.

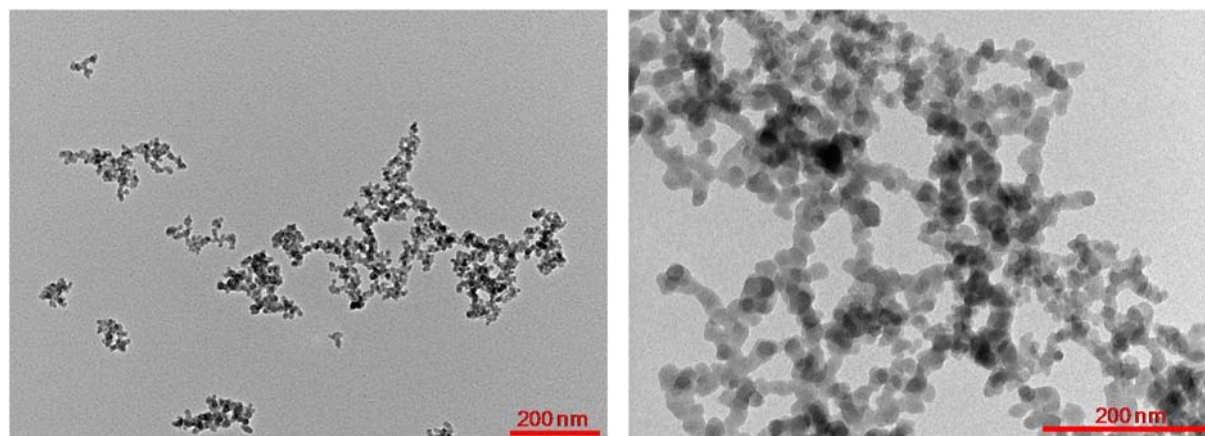


Figure S3. TEM images of hydrophilic SiO₂NPs (PlasmaChem). The quoted size is 10 nm, and the size distribution from TEM is shown to be in the range 10-15 nm.

- **Zeta potential measurements of the hydrophilic SiO₂ NPs**

Zeta potential measurements were conducted using a Malvern Zetasizer Nano ZS (Malvern Instruments, Malvern, Worcestershire, UK) using a 633 nm laser set at 173° with respect to the incidence (*i.e.* in the back scattering mode). Measurements were taken after a one minute equilibration time at 25°C. At least 10 readings were taken, each integrated over 10 s, and these were then averaged. This was then repeated twice more, and thus an average value was obtained from at least 30 readings.

To prepare the NP dispersion, 15 mg of the NPs was sonicated in 15 mL MilliQ water (18.2 MΩ cm⁻¹) for 30 min. 600 uL of the dispersion was then diluted with 1,800 uL of MilliQ water (*i.e.* with a 1:3 volume ratio). This gave a strong zeta potential peak at 34.9 mV. The measurement was also performed in pH 7.5 HPCE buffer solutions (Sigma-Adrich Analytic Reagents), and a zeta potential of 46.9 mV was recorded.