

## Supporting Information

### for “Adsorption of Sterically-Stabilized Latex Particles at Liquid Surfaces: Effects of Steric Stabilizer Surface Coverage, Particle Size and Chain Length on Particle Wettability”

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### Specimen calculation for the estimation of surface coverage from $^1\text{H}$ NMR

#### Example given for entry No. 1, Table 1

Stabilizer content as calculated by  $^1\text{H}$  NMR = 1.1 wt %

We can therefore assume that if we have 1.000 g of PGMA-PS latex, 0.989 g will be polystyrene and 0.011 g will be PGMA, hence the mass fraction of polystyrene,  $f_{PS}$  is 0.989.

We can calculate the specific surface area ( $A_s$ ) of the latex using;

$$A_s = \frac{3}{\rho R}$$

where  $\rho$  is the density of polystyrene (in  $\text{g m}^{-3}$ ) and  $R$  is the mean radius of the latex (in m) determined by disk centrifuge photosedimentometry. Applying this equation to the particles shown as entry 1 in Table 1, we obtain

$$A_s = \frac{3}{1.05 \times 10^6 \times 398 \times 10^{-9}}, \text{ hence } A_s = 7.18 \text{ m}^2 \text{ g}^{-1}.$$

This value of  $A_s$  is corrected for just the polystyrene core in the following way. Assuming 1.000 g of latex we can write

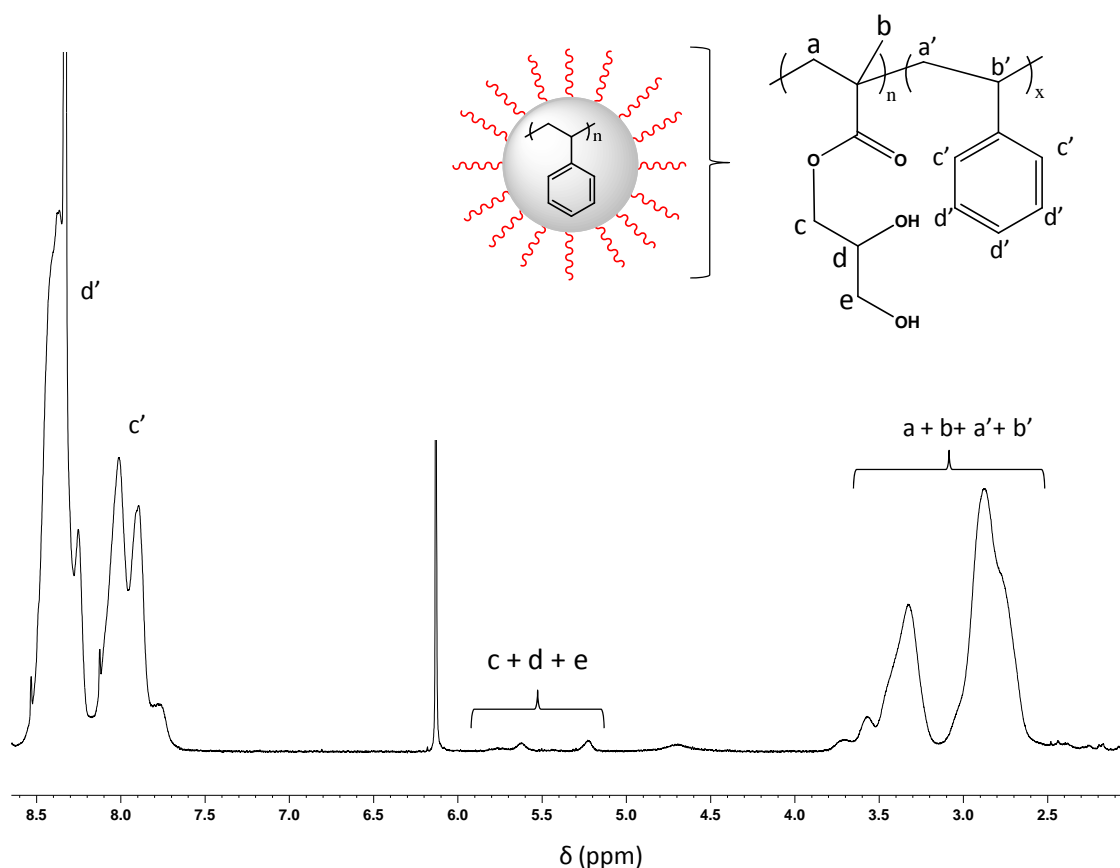
$$\frac{A_s(\text{core})}{A_s} = \left( \frac{R_c}{R} \right)^2$$

where  $A_s(\text{core})$  is the surface area of the cores in 1.000 g of latex and  $R_c$  is the core radius. The ratio  $R_c/R$  can be estimated from the mass fraction of polystyrene (the core),  $f_{PS}$ . Assuming that the core and the shell (PGMA) have the same density  $\rho$ , we obtain  $f_{PS} = (R_c/R)^3$ , and finally

$$A_s(\text{core}) = A_s \times (f_{PS})^{2/3} \quad (\text{S5})$$

In the considered case, the core surface area of 1.000 g of latex,  $A_s(\text{core}) = 7.18 \times 0.989^{2/3} \approx 7.1 \text{ m}^2$ .

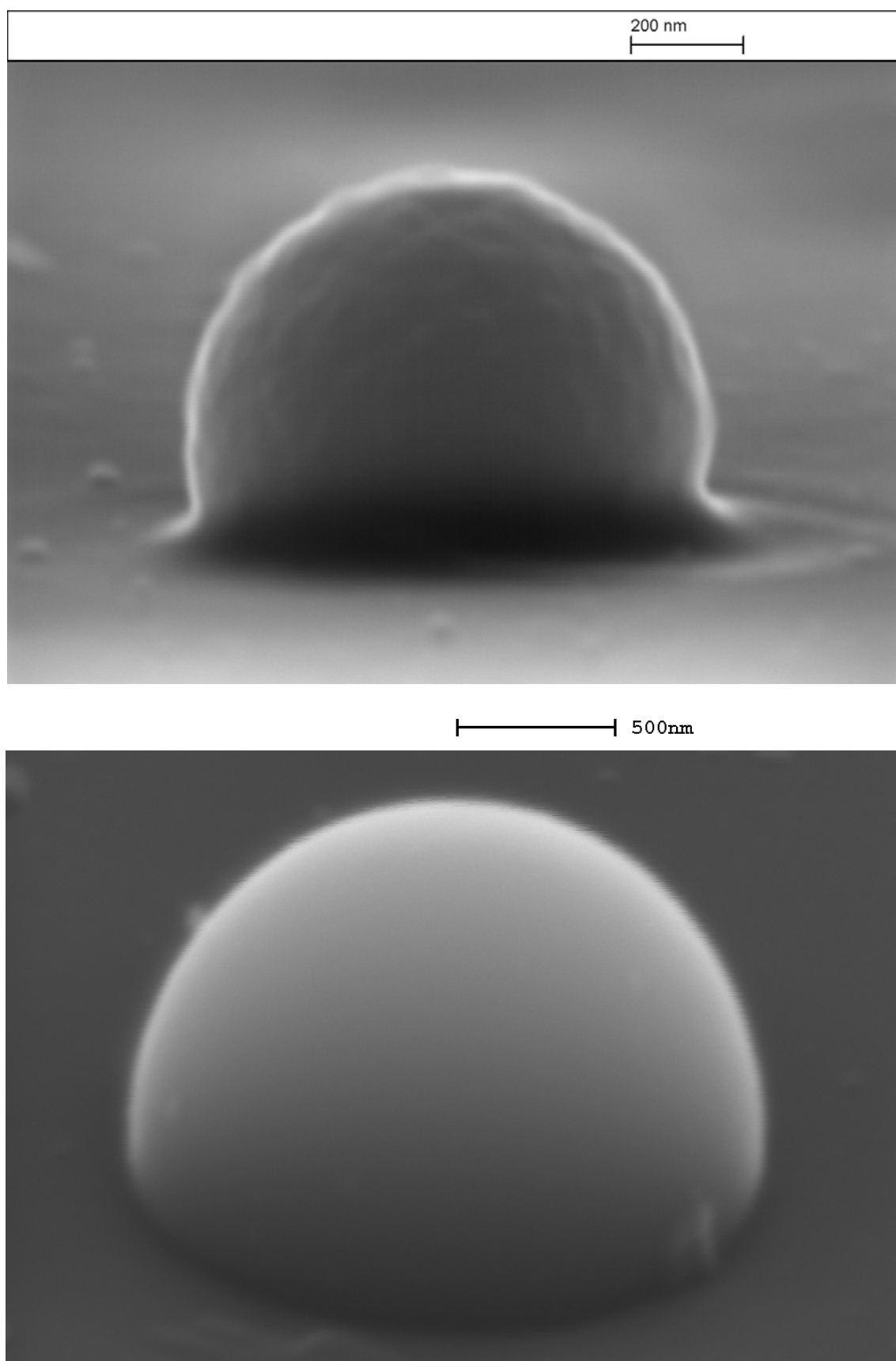
For 1.000 g of latex there is 0.011 g of PGMA, hence  $\Gamma = 11/7.1 = \underline{1.5 \text{ mg m}^{-2}}$ .



**Figure S1.** Representative  $^1\text{H}$  NMR spectra recorded in  $d_5$ -pyridine for a dissolved PGMA-PS latex. The peaks assigned to PGMA ( $c + d + e$ ) are integrated and compared to those due to the polystyrene ( $c'$ ) to allow an estimate of the PGMA stabilizer content of the latex particles.

### Surface roughness of sterically-stabilized PGMA<sub>n</sub>-PS latex particles

Figure S2 shows high resolution SEM images of a sterically-stabilized PGMA<sub>50</sub>-PS latex particle used in this study and a charge-stabilised (bare) sulfate polystyrene latex particle, both characterised by the Gel Trapping technique (GTT). It is evident from the images that the surface roughness of the PGMA-grafted latex particles is not an artefact of the GTT technique as the sulfate latex surface treated and imaged at identical conditions looks fairly smooth. The other PGMA stabilised particles used in this study look similar to that shown at higher magnification. We envisage that this surface roughness of the PGMA-PS latex particles is a result of the surface structuring of the chains of the PGMA stabiliser during the polymerisation process of the particles preparation. Therefore, the surface roughness is an inherent property of these sterically-stabilised latex particles.



**Figure S2.** SEM images of a sterically stabilized PGMA<sub>50</sub>-PS latex particle (top) and a charge-stabilised sulfate polystyrene latex particle (bottom), both partially embedded in a PDMS resin and characterised by the GTT.