

## Supporting Information

*Soft Matter* manuscript

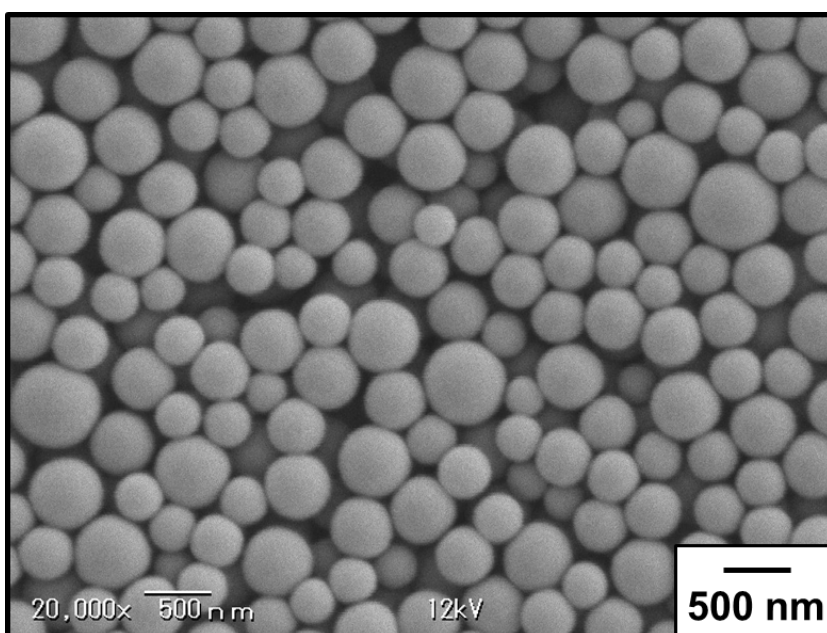
‘Observations of Liquid Marble and Water Droplet Interactions and Stability’

by K. Ueno *et al.*

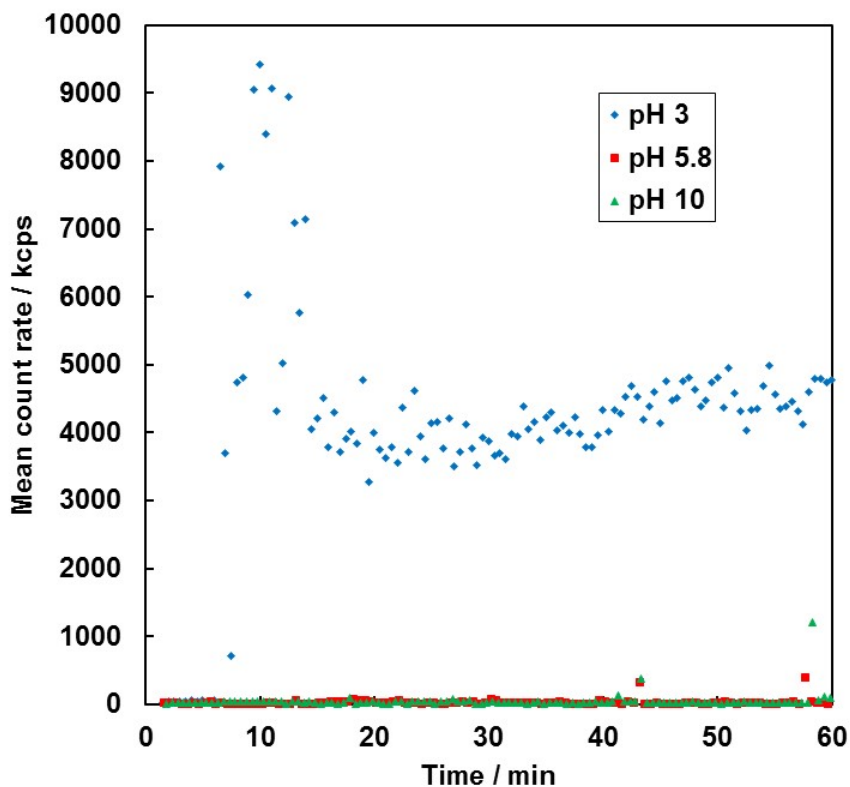
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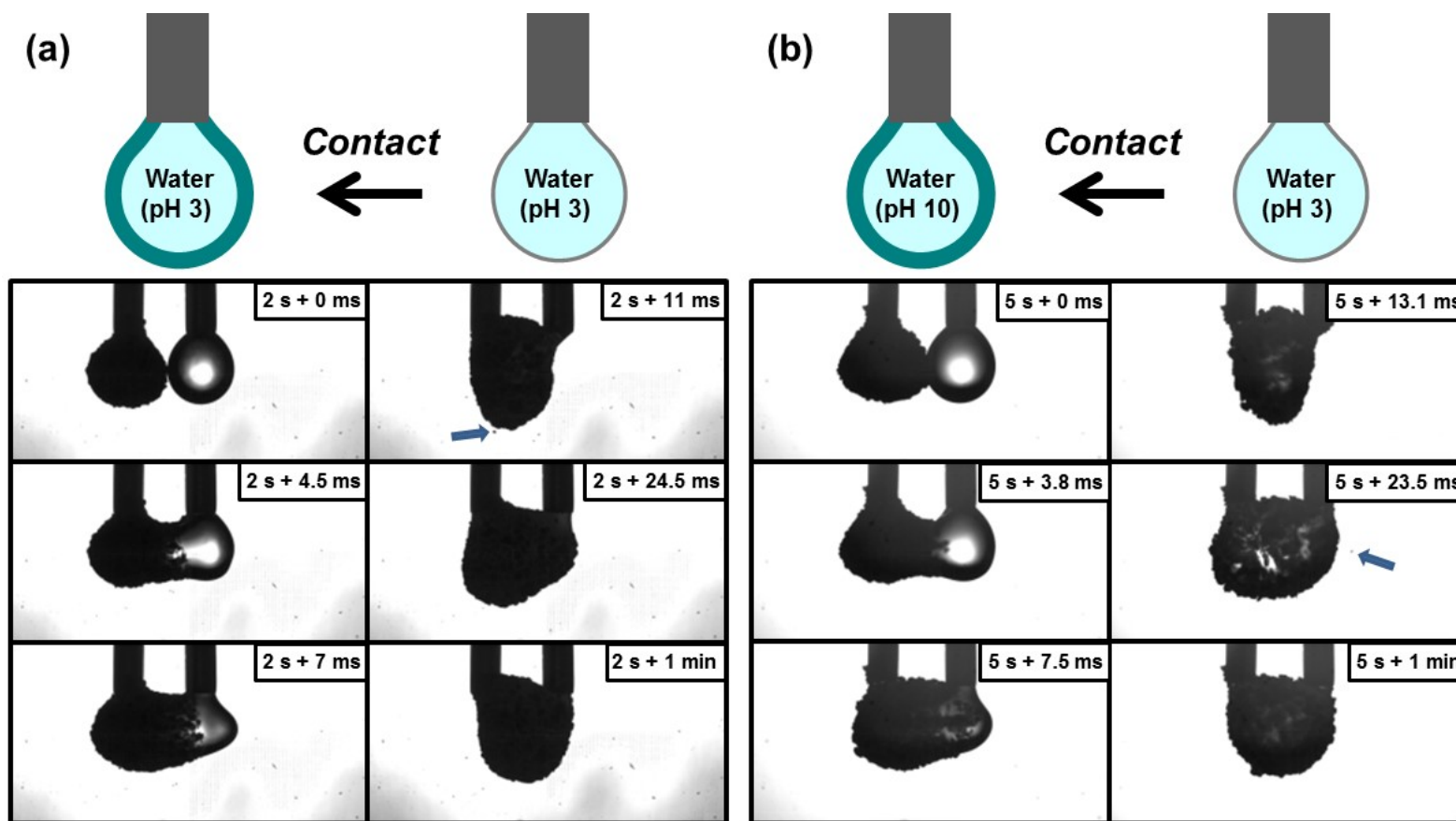
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**Supporting Figure S1.** SEM image of dried PDEA-PS particles.

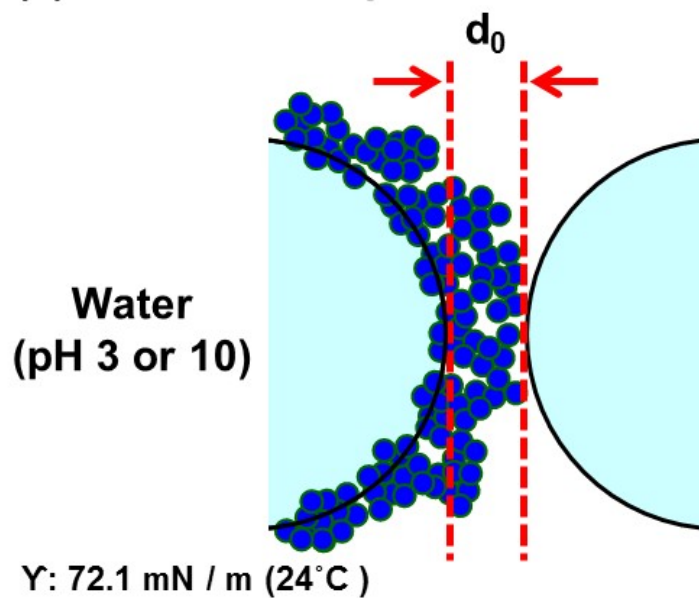


**Supporting Figure S2.** Particle count in aqueous solutions at pH 3 ( $\diamond$ ); pH 5.8 ( $\square$ ); and pH 10 ( $\triangle$ ) where particles were initially placed at the interface. Mass of particles scattered on solution surface were pH 3 (0.0153 g), pH 5.8 (0.0044 g) and pH 10 (0.0115 g). Further evidence in support of the above arguments concerning the wetting of the particles is demonstrated in Fig. S2 which shows that the particles placed on the interface of a solution at pH 6 (5.8 (Milli-Q water) and 10 did not transfer to the aqueous solutions (within 1 hour of measurement). The particles placed on the pH 3 solution interface did become immersed did transfer. Although there is a time axis on this figure, it should be noted that it does not represent the wetting kinetics. It is a cumulative time including the (i) time lag from the moment of placing the particles and starting the measurements, (ii) protonation of the particle steric stabilising hairs, (iii) transfer of the particles to the liquid phase and (iv) diffusion of the particles to the measurement zone area (laser height).

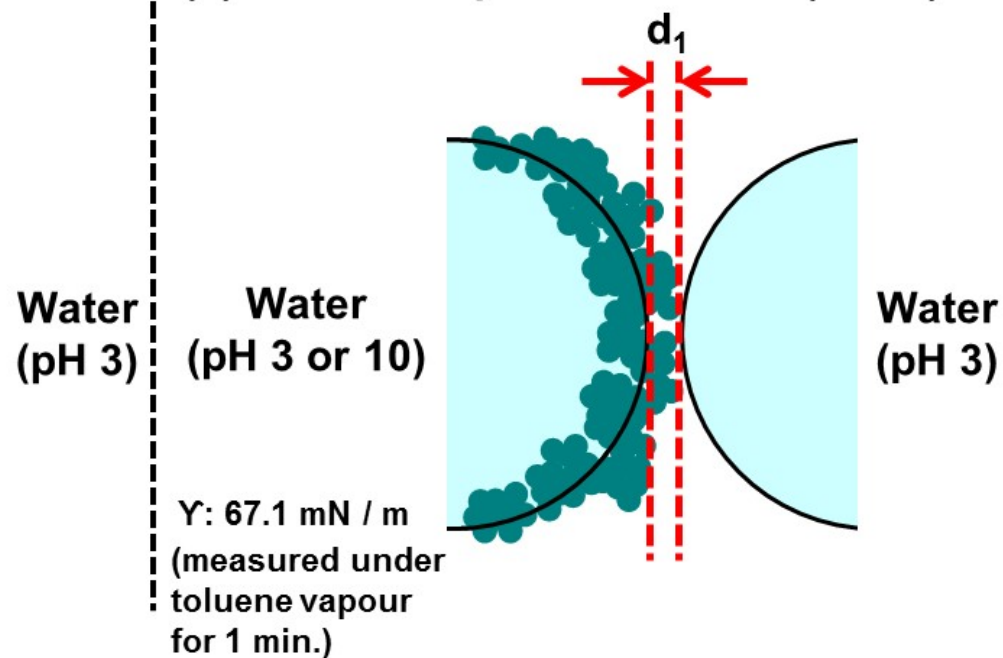


**Supporting Figure S3.** Selected images taken from video footage of the coalescence between PDEA-PS particle-stabilized liquid marble with (a) pH 3 or (b) pH 10 after 1 min toluene vapor treatment and bare water droplet (pH 3). The time shown in each image indicates induction time + time since coalescence. Arrows show flocs detached from the liquid marble. The outer diameter of the capillaries is 1.07 mm which acts as an appropriate scale bar.

(a) No toluene vapour treatment

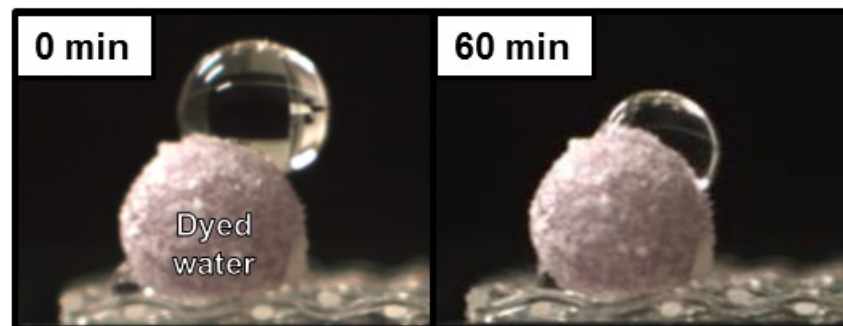


(b) Toluene vapour treatment (1 min)

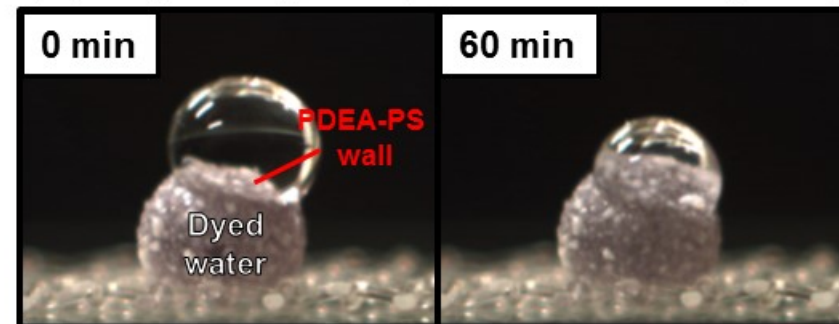


**Supporting Figure S4.** Scheme illustrating interaction between a bare water droplet at pH 3 and (a) a liquid marble and (b) a liquid marble after 1 min toluene vapour treatment.

**(a) Capsule (pH 3) vs bare water (pH 3)**



**(b) Capsule (pH 10) vs bare water (pH 3)**



**Supporting Figure S5.** Digital photographs showing contact between capsules containing alizarin-dyed water with (a) pH 3 and (b) pH 10 after 4 min toluene vapour treatment and bare water droplet (pH 3). Bare water droplets were not coloured even after 1 h contact, which indicates no contact between water inside capsule and bare water droplet.