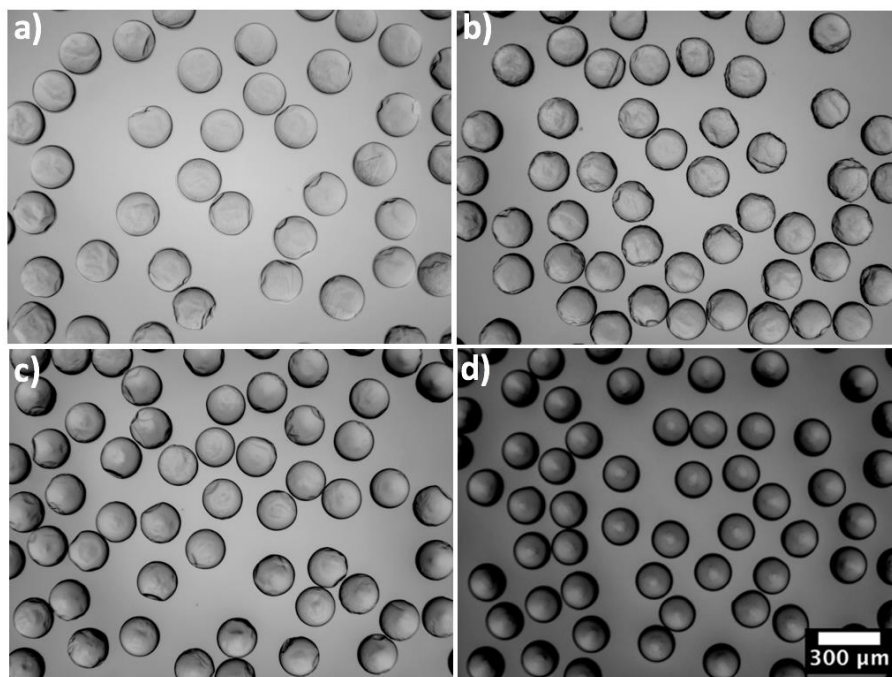
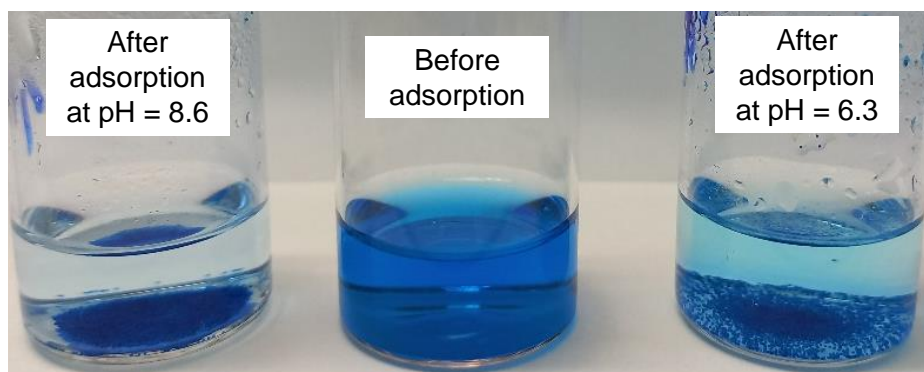


## Supplements

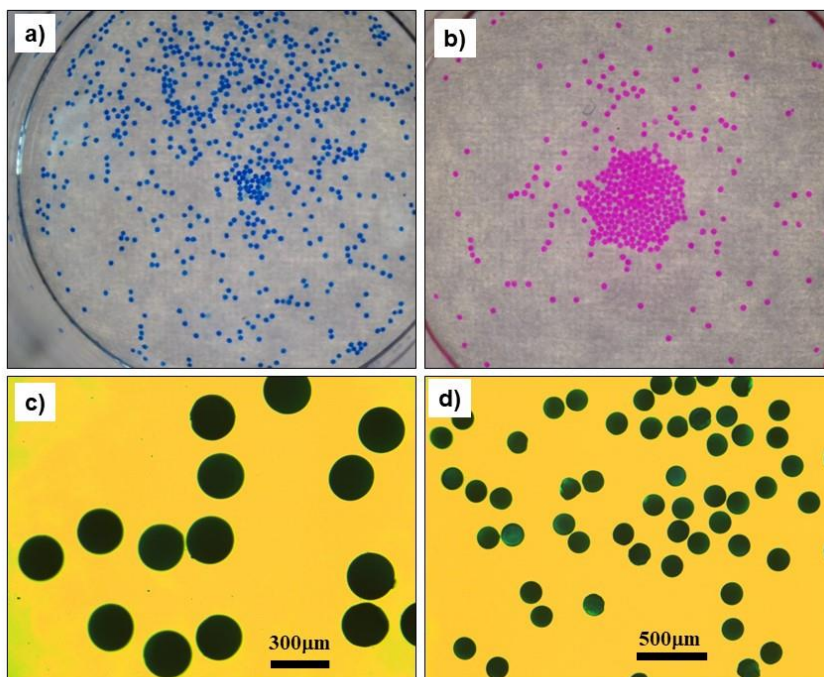


**Figure S1.** PEGDA-PEG-AA (2%) microgel particles suspended in silicon oil observed through an optical microscope after exposure to UV light of 75 mW/m<sup>2</sup> for (a) 120 s, (b) 240 s, (c) 480 s, and (d) 600 s. Longer UV exposure times resulted in a smoother surface.

Particles gradually shrink during polymerization due to losing internal water and have a wrinkled surface until they become completely polymerized, Figure S1 (a-c). A wrinkled surface occurred due to internal stresses as a result of non-uniform polymerization, with a solid crosslinked core and liquid uncured surface region.



**Figure S2.** Photographs of the initial MB solution (in the middle), and the MB solution after 24 h of adsorption onto PEGDA-PEG-AA(2%) microgel at pH = 6.3 (right) and pH = 8.6 (left).



**Figure S3.** (a)-(b): Photographs of PEGDA-AA(2%) beads dyed with 10 ppm MB solution (a) and 10 ppm RhB solution (b) at pH 6; (c)-(d): Optical microscopy images of PEGDA-AA(4%) beads dyed with 100 ppm MB solution at pH 6 taken using 4× objective lens (c) and 2× objective lens (d).

PEGDA-AA(4%) beads dyed with 100 ppm MB are much darker than PEGDA-AA(2%) beads dyed with 10 ppm MB due to the higher charged particles and much higher concentration of the initial MB solution.