The Nature of the Silicophilic Fluorescence of PDMPO

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Supplementary Information

pH determination using the sigma function of PDMPOH+

The sigma values (σ) obtained from Gaussian fitting relate to the full width at half maximum (FWHM) of the peak according to equation (2√lnσ). This can also be used as a pH indicator. The peak width values of PDMPOH+ in the presence of silica diverge from the free dye at intermediate pH range but converge at high and low pH.

Figure S1: pH estimation using peak width of PDMPOH+
pH determination on silica in the pH range 5.4 to 9.7 using the wavelength shift of PDMPOH$_2^{2+}$

The pH dependent chromaticity of PDMPOH$_2^{2+}$ is linear between pH 5.4 and 9.7 allowing the chromaticity of the dye in the presence of silica nanoparticles to be used as a probe of pH. In the presence of silica, the dye exhibits a blue shift from pH 2.2 (540 nm) to pH 4.5 (519 nm) followed by a red shift up to pH 9.7 (531 nm). At a very high basic pH wavelengths of PDMPOH$_2^{2+}$ for the dye by itself and on silica roughly overlap.

Figure S2: pH determination on silica in the pH range 5.4 to 9.7 using the chromaticity of PDMPOH$_2^{2+}$.