Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.


**The Nature of the Silicaphilic Fluorescence of PDMPO**

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**Supplementary Information**

**pH determination using the sigma function of PDMPOH$^+$**

The sigma values ($\sigma$) obtained from Gaussian fitting relate to the full width at half maximum (FWHM) of the peak according to equation ($2\sqrt{\ln}\,\sigma$). 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.

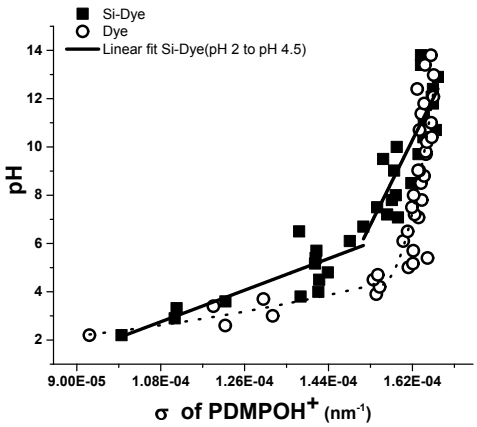


**Figure S1:** pH estimation using peak width of PDMPOH$^+$

**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 (519nm ) 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.

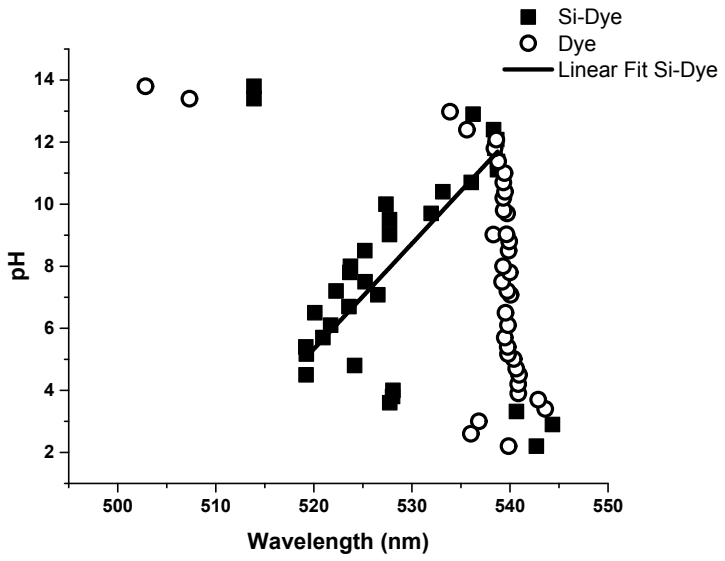


**Figure S2**: pH determination on silica in the pH range 5.4 to 9.7 using the chromaticity of $PDMPOH_2^{2+}$.