Electronic Supplementary Material (ESI) for Journal of Materials Chemistry

Whispering Gallery Mode Emission Generated in Tunable Quantum Dot Doped Glycerol/Water and Ionic Liquid/Water Microdroplets Formed on a Superhydrophobic Coating

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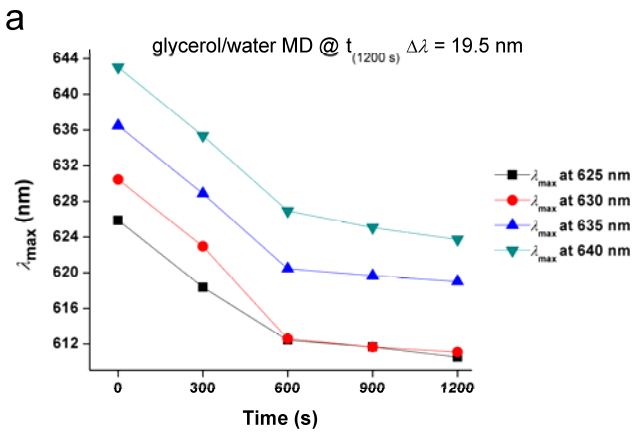
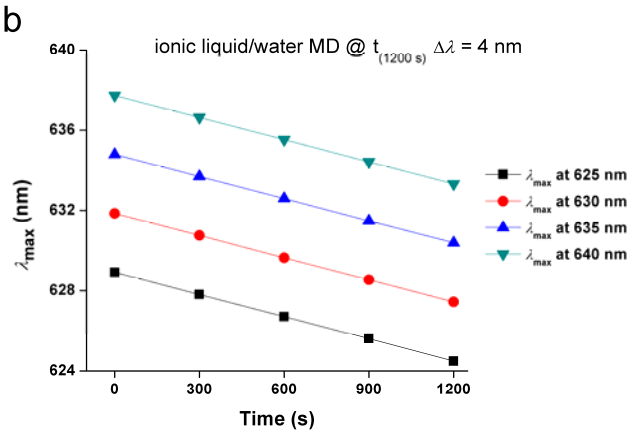
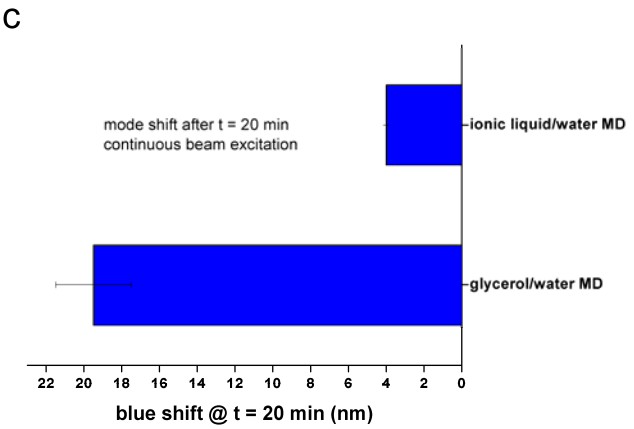
Electronic Supplementary Information

Time dependent WGM emission analysis of glycerol/water and ionic liquid/water microdroplets

Employing a QD based WGM reporting system alleviates problems associated with photobleaching irrespective of reporter concentration in the microdroplet. As a result, a WGM performance analysis was conducted during continuous free beam excitation of a water/glycerol QD-doped microdroplet. Maximum laser beam output (465.5 µW) was coupled to the microdroplet for over 20 minutes to produce an extreme excitation environment while examining the WGM emission stability. Figure ESI. 1a displays the λ_{max} coordinates of 4 selected modes generated by the microdroplet which were monitored at each time point. The microdroplets WGM exhibited a total blue shift of 19.5 nm (droplet evaporation). Apart from this, the WGM signal photointensity decreased minimally, the *Q*-factor and the number of identifiable peaks remained relatively unchanged. Employing these same excitation parameters, a QD-doped ionic liquid microdroplet is shown to generate a far more stable WGM signal (4 nm total blue shift) (ESI. 1(b-c)).







ESI. 1 Time dependent microdroplet WGM emission analysis. Utilizing a maximum (465.5 µW) laser energy, emission spectra from a single glycerol/water (12.24 µm) and single ionic liquid-microdroplet (11.80 µm) were collected at 0 s, 300 s, 600 s, 900 s and 1200 s during continuous beam exposure. Four modes positioned about wavelengths 625 nm, 630 nm, 635 nm and 640 nm were monitored during excitation. (a) Water/glycerol microdroplet. (b) ionic liquid microdroplet; (c) Blue shift comparison of ionic liquid/water and glycerol/water microdroplets after 20 min (1200s) continuous wave excitation. The error bars represent the standard deviation of the WGM shift of 4 modes during the experimental duration.