

Supporting Information

Self-assembly and pH Response of Electro-active Liquid Core - Tetra(aniline) Shell Microcapsule

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Supplementary Figures

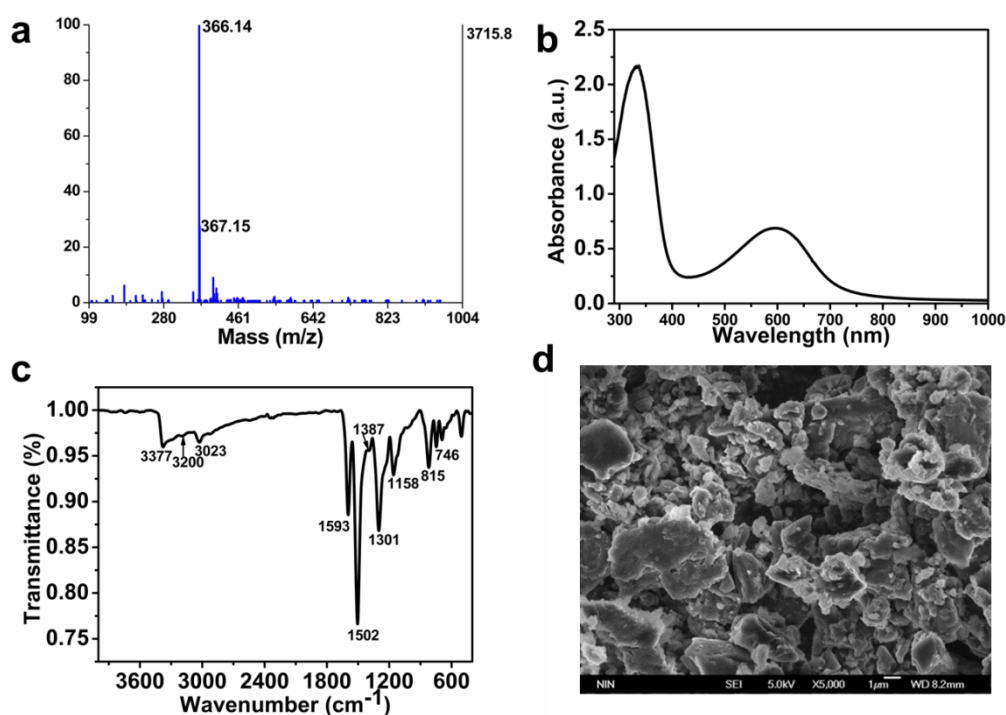


Fig. S1 (a) MALDI-TOF, (b) UV-Vis, (c) FT-IR spectra, and (d) SEM image of phenyl/NH₂-capped TANI in its emeraldine base oxidation state (TANI-EB). The UV-Vis spectrum was taken in dimethyl sulfoxide. The MALDI-TOF MS of TANI displays the most obvious molecular ion peak at m/z value of 366, which is equivalent to 4 repeat units $-C_6H_4-NH-$.¹ In the UV-Vis spectra of TANI-EB, the main characteristic bands located at 331 nm and 581 nm are ascribed to $\pi-\pi^*$ transitions of the benzene ring and the benzenoid to quinoid ($\pi_B-\pi_Q$) excitonic transition, respectively. The main peaks in the FT-IR spectra of TANI-EB located at 1593 and 1502 cm⁻¹ correspond to C=C stretching vibrations of quinone and benzene ring, respectively. All these data support the formation of TANI-EB.

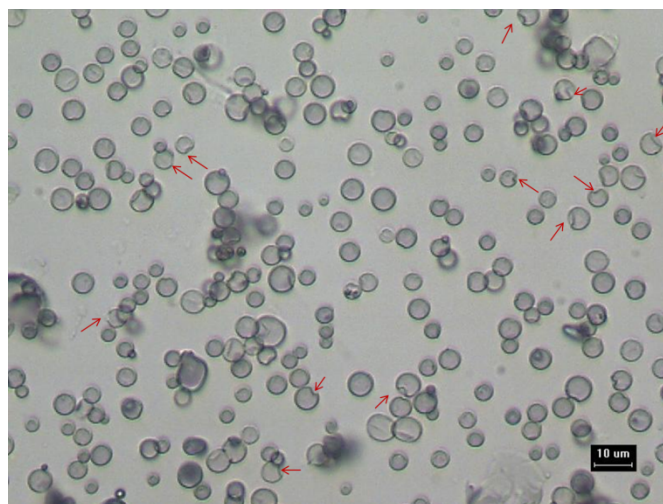


Fig. S2 OM image of the vacuum- freezing dried microcapsules. The arrows showing the obviously hole on the surface

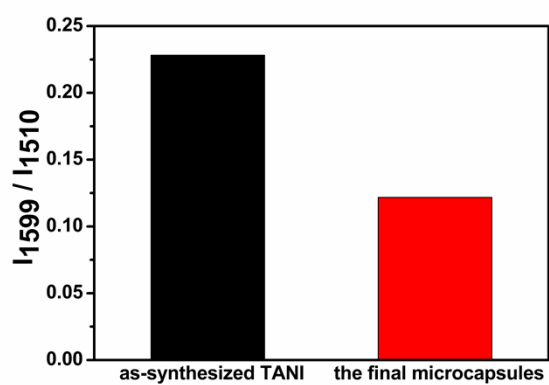


Fig. S3 Relationship of the intensity ratio (I_{1599}/I_{1510}) for two TANI-containing samples.



Fig. S4 Photograph of 2 mg, 1.5 mg, 1 mg and 0.5 mg TANI dissolved in 4 ml glacial acetic acid. A small amount of HAc-TANI-ES precipitated out of all four samples, indicating that HAc-TANI-ES has slightly lower solubility in glacial acetic acid.

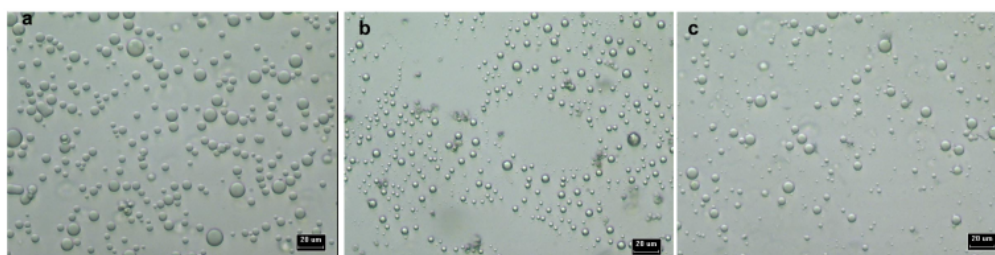


Fig. S5 Optical microscopy images of microcapsules obtained by the same preparation method using propionic acid (a), β -naphthalene sulfonic acid (β -NSA) (b), and dodecylbenzene sulfonic acid (DBSA) (c) instead of glacial acetic acid as the dopant acid. Propionic acid, β -NSA and DBSA all exhibit some characteristics of amphiphilic structures. Thus, it is expected that their salt formed by doping with tetra(aniline)s would exhibit amphiphilic behaviour too, enabling them to bridge the oil-water droplet interface.

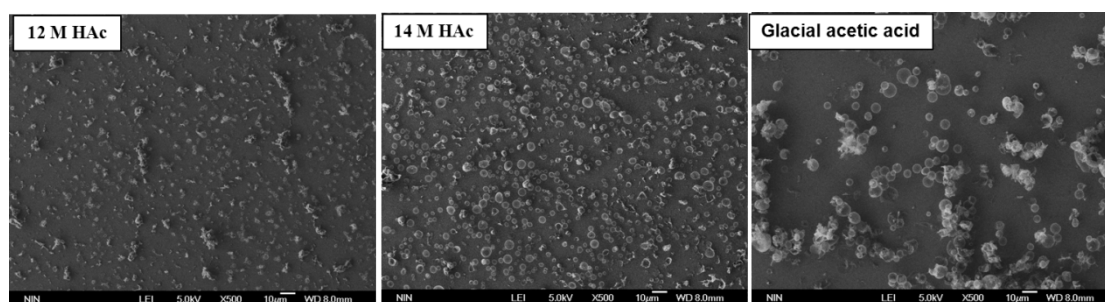


Fig. S6 SEM images of microcapsules prepared using 12 M HAc, 14 M HAc and glacial acetic acid.

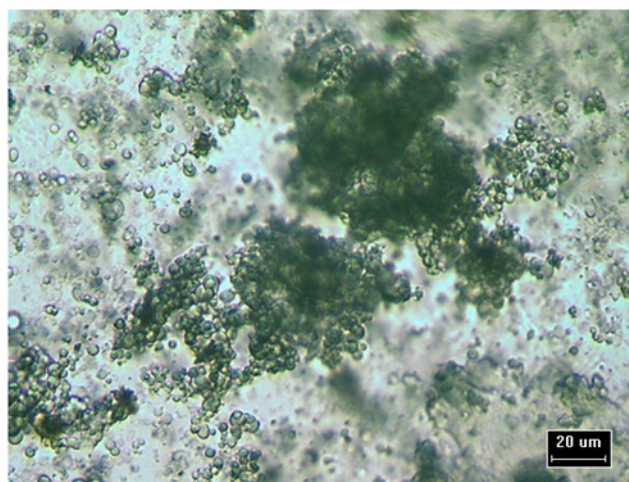


Fig. S7 Optical micrograph of microcapsules dispersion at pH=1.0 adjusted by 0.1 M H₂SO₄.

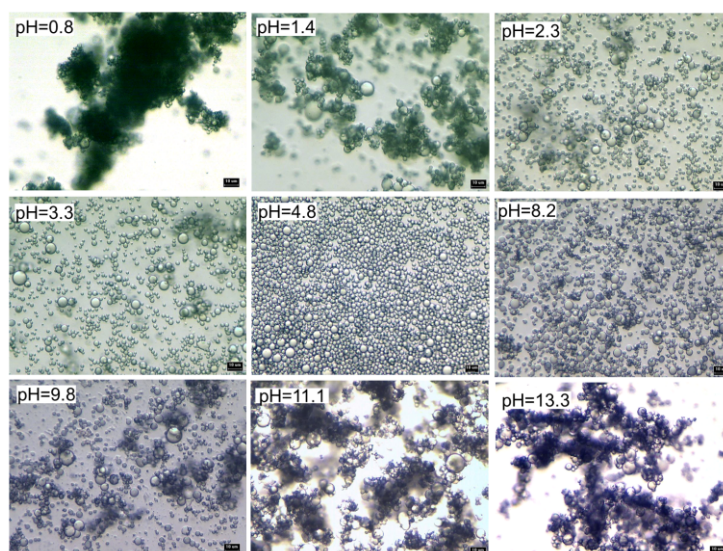


Fig. S8 Optical micrographs illustrate pH-dependent stability of microcapsules at different pH solution for 1 h after preparation. The pH of the aqueous phase was adjusted by addition of 0.1 M HCl or 0.1 M NaOH.

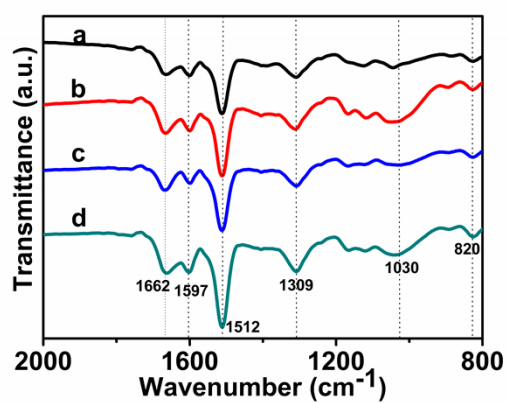


Fig. S9 FT-IR spectra of microcapsules with n-octane (a), n-heptane (b), n-hexane (c) and petroleum ether (d) as core. The chemical structure of these four microcapsules is the same in general.

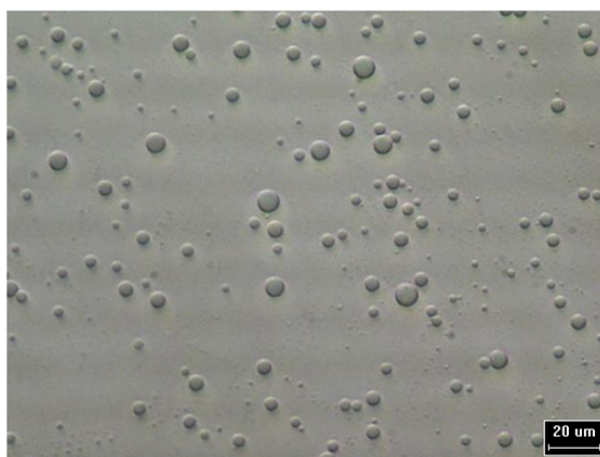


Fig. S10 OM image of aniline dimer microcapsules obtained by the same process.