Supporting Information

Self-Assembled Composite Nano-Materials exploiting a Thermo-Reversible *n*-Acene Fibrillar Scaffold and Organic-Capped ZnO Nanoparticles

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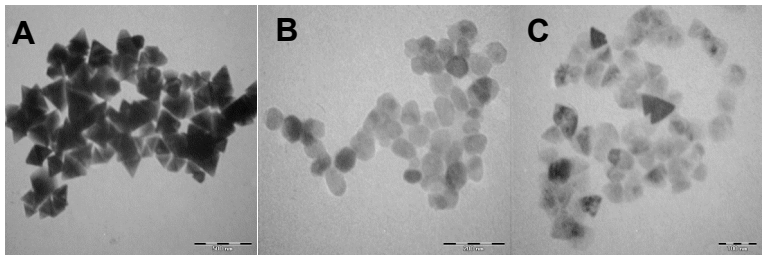

Fig. SI.1 TEM images of some ZnO NPs: (A) NM1 (scale bar 500 nm) from thermal decomposition (240°C) of zinc acetate in hexadecylamine, average size 50 nm (from TEM), 47 nm (from XRD); (B) NM2 (scale bar 100 nm) from thermal decomposition (220°C) of zinc cupferronate in n-octylamine, average size 35 nm (TEM), 41 nm (from XRD); (C) NM3 (scale bar 200 nm) from thermal decomposition (250°C) of zinc oleate in oleic acid/oleylamine mixture, average size 40 nm (TEM), 34 nm (from XRD).

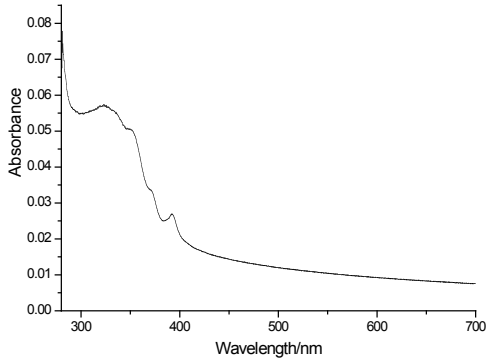

Figure SI2. (a) Absorption spectrum of 1.8 x 10^{-7} M A9-NPs in toluene, optical path length is 1 cm.

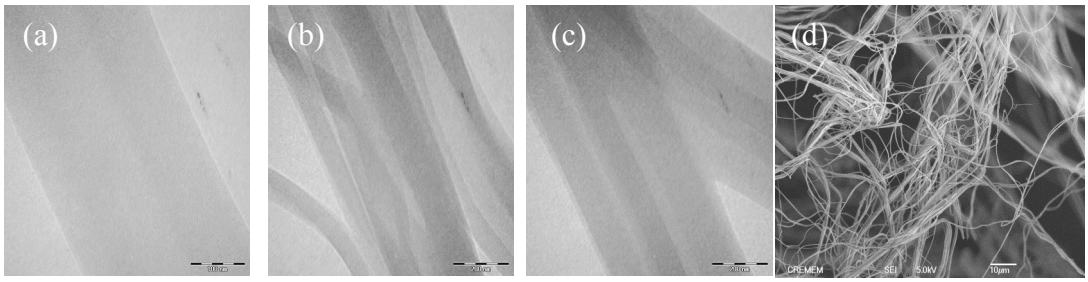

Figure SI3. TEM images of DDOA aerogels obtained from $scCO_2$, containing the following ZnO NPs: (a) OL-NPs, scale bar 100 nm; (b) A23-NPs, scale bar 200 nm; (c) A9-NPs, scale bar 200 nm. (d) SEM image of DDOA aerogel obtained in the presence of OL-NPs, scale bar 10 μm.

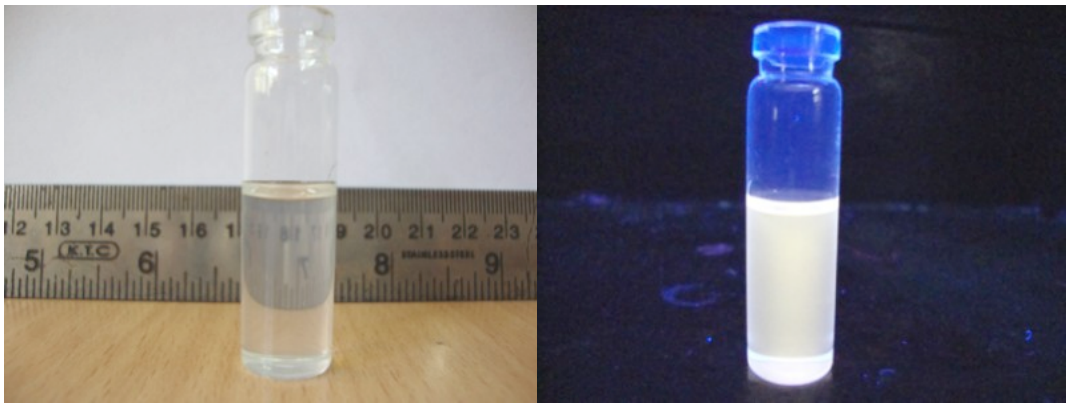

Figure SI4. Photos of OL-NPs in toluene: left at daylight, right under UV irradiation in a dark room.

Table SI1: XRD data for the ZnO NPs synthesized.

Sl. No	**Fitting accuracy R^2 for Gaussian**	**Peak center Å**	**Peak height Intensity, a.u.**	**TEM average particle size /nm**	**XRD Estimated particle size /nm**	**FWHM /nm**
NM1	0.98	56.68	8620	50	47.01	0.3043
NM2	0.99	56.73	4840	35	40.57	0.3530
NM3	0.99	56.65	4378	40	34.27	0.4171
OL-NPs	0.97	56.66	554.40	4	5.06	2.8255
A23-NPs	0.94	56.61	240.00	4	4.58	3.1155

Table SI2: Dynamic rheology data for DDOA and DDOA-NP gels in *n*-BuOH. The G′ and G″ values shown in the table are obtained from frequency sweep experiments performed at a fixed stress of 1.0 Pa. The values are at f = 1.0 Hz. The σ* values shown are obtained from stress sweep experiments at a fixed frequency of 0.5 Hz.

Sample Description	G′ (Pa)	G″ (Pa)	G′/ G″	σ* (Pa)
DDOA gel	675	69	9.8	44
DDOA/OL-NP	690	67	10.3	53
DDOA/A23-NP	634	70	9.1	48