

Electronic Supplementary Information (ESI)

A Green Miniemulsion-Based Synthesis of Polymeric Aggregation-Induced Emission
Nanoparticles

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S1. Materials

Diphenylacetylene (99%) and allyldichloromethylsilane (97%) were purchased from Alfa Aesar Chemical Co., Ltd. and used as received. Anhydrous magnesium sulfate (AR) and neutral alumina (activated, 100-200 mesh) were purchased from Aladdin Chemistry Co. Ltd.

Dichloromethane (AR) and petroleum ether (AR) were purchased from Sinopharm Chemical Reagent Co.,Ltd. Dichloromethane were purchased from Meryer Technologies Co., Ltd. Lithium wire ($\geq 98\%$, diameter 3.2 mm) was purchased from Sigma Aldrich Co. Ltd.

S2. Preparation of 1-allyl-1-methyl-2,3,4,5-tetraphenylsilole(AMTPS)

Diphenylacetylene (0.879 g, 4.88 mmol) was dissolved in 3 mL of THF, and magnetically stirred with freshly cut lithium shavings (0.038 g, 5.46 mmol) at 700 rpm for 4 h at room temperature under the protection of N_2 . 30 mL of THF and 0.265 mL of allylmethyldichlorosilane were added to the above solution. The mixture was heated and reacted under the condition of reflux for 4 h. After reaction, the mixture was cooled to room temperature and poured into water. The organic layer was extracted with dichloromethane. The resulting organic mixture was washed with water, and dried in the presence of anhydrous magnesium sulfate. After the solvent of the filtrate was removed, the crude product was further purified by a silica gel column by using petroleum ether as eluent.

S3. 1H NMR and ^{13}C NMR Spectra of AMTPS

1H NMR (400MHz, $CDCl_3$), δ (TMS, ppm): 7.09-6.78 (m, -Ph), 5.74 (m, 1H), 4.85 (m, 2H), 2.01 (d, 2H, $SiCH_2$), 0.50 (s, 3H, $SiCH_3$); ^{13}C NMR (400MHz, $CDCl_3$) δ [ppm] 155.01, 140.19, 139.74, 138.71, 133.09, 129.99, 128.98, 127.91, 127.37, 126.65, 126.22, 122.55, 113.99, 77.00, 20.82, -5.92 (Fig. S1A and B).^[1]

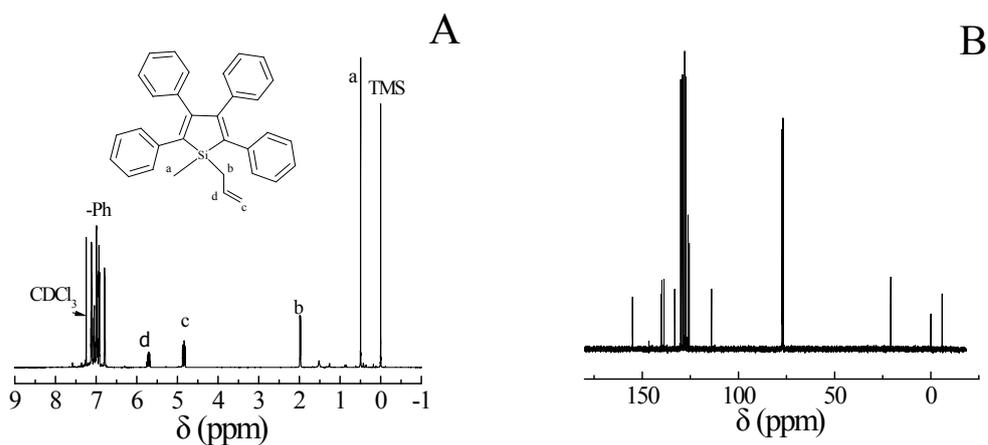


Fig. S1. ^1H NMR (A) and ^{13}C NMR (B) spectra of AMTPS.

S4. PL behavior of AMTPS in THF/water mixture

The THF solution of AMTPS is totally non-emissive (Fig. S2A). The photoluminescence (PL) intensity of AMTPS remained unchanged till the volume fraction of water reached 80 vol%. A rapid increase of the PL intensity was observed with the further addition of water due to the aggregation of AMTPS. The maximum PL intensity was reached at 99 vol% of water. The maximum fluorescence intensity of AMTPS at 496 nm is 91.2 times higher than that in the pure THF solution (Fig. 2A and B).

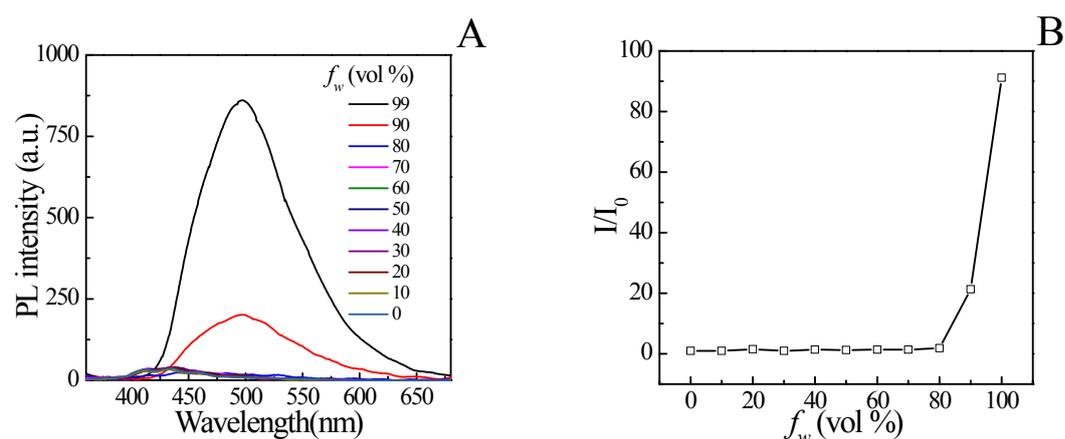


Fig. S2. (A) PL spectra of AMTPS in the mixed solution of THF/water with various water fractions (f_w (vol%)). (B) Plots of I/I_0 versus the water fraction of the mixed solution of THF/water, where I_0 and I are the PL intensities in the pure THF and in the

mixed solution of THF/water, respectively.

S5. PL behavior of AMTPS in St solution

AMTPS (0.003 g) was dissolved in St (340 g) to form a homogeneous solution. 2 mL of the resulting solution was used to evaluate the PL intensity of the St solution of AMTPS on a Hitachi F-4600 spectrofluorometer in a spectral range of 360 to 650 nm. The PL spectrum of pure St was recorded on the same machine through the same protocol.

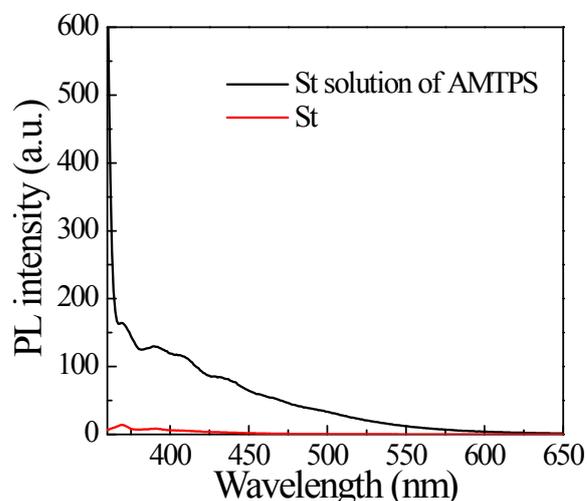


Fig. S3. PL spectra of St and the St solution of AMTPS.

S6. FTIR spectra of AMTPS, PSA-0, and PSA-20

Fourier transform infrared spectroscopy (FTIR). Samples were first dissolved in THF. The THF solutions were placed on a potassium bromide wafer. The FT-IR spectra of the dried samples were recorded a transmission mode on a Vertex 70 FTIR spectrometer (BRUKER OPTICS, Germany).

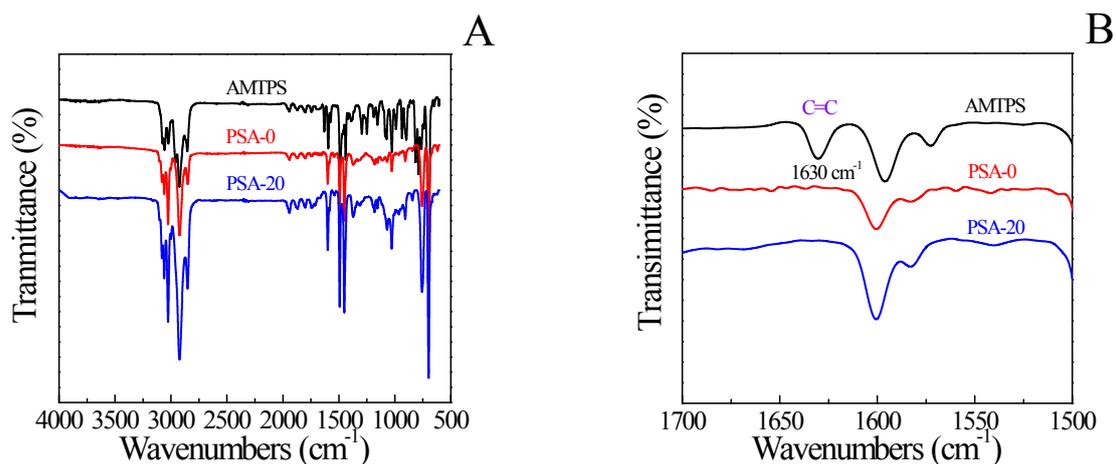


Fig. S4. FTIR spectra of AMTPS, PSA-0, and PSA-20 in the whole spectral range (A) and in the spectral range of 1500–1700 cm⁻¹ (B).

S7. ¹H NMR spectra of PSA-0 and PSA-20

¹H Nuclear magnetic resonance spectroscopy (¹H NMR). 15 mg of the samples were dissolved in 0.6 mL of deuterated chloroform. ¹H NMR spectra of PSA-0 and PSA-20 were recorded on a Bruker AV 400 NMR spectrometer with tetramethylsilane as an internal standard.

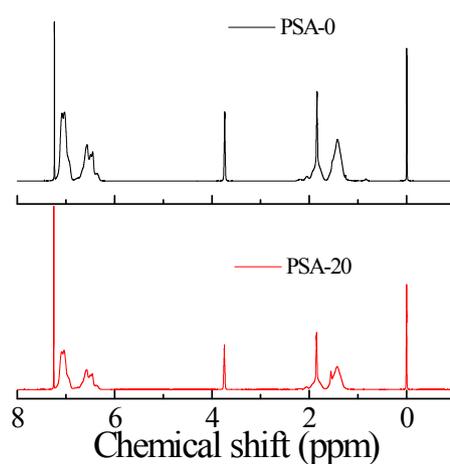


Fig. S5. ¹H NMR spectra of PSA-0 and PSA-20.

Reference

1. K. Amro, S. Clément, P. Déjardin, W. E. Douglas, P. Gerbier, J.-M. Janot and T. Thami, *J. Mater. Chem.*, 2010, **20**, 7100-7103.