Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Polarized Resonance Synchronous Spectroscopy as a Powerful Tool for Studying the Kinetics and Optical Properties of Aggregation-Induced Emission

Joanna Xiuzhu Xu,[⊥] *Guangle Niu,*[Δ] *Ben Zhong Tang,*[Δ] *and Dongmao Zhang*[*,⊥]

[⊥] Department of Chemistry, Mississippi State University, Mississippi State, Mississippi, 39762, United States

[Δ] Department of Chemistry, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, 999077, Hong Kong, China

[*] Corresponding authors: Dongmao@chemistry.msstate.edu

Content

1. PRS2 data analysis and DLS data spectra for TPMN water fraction series samples

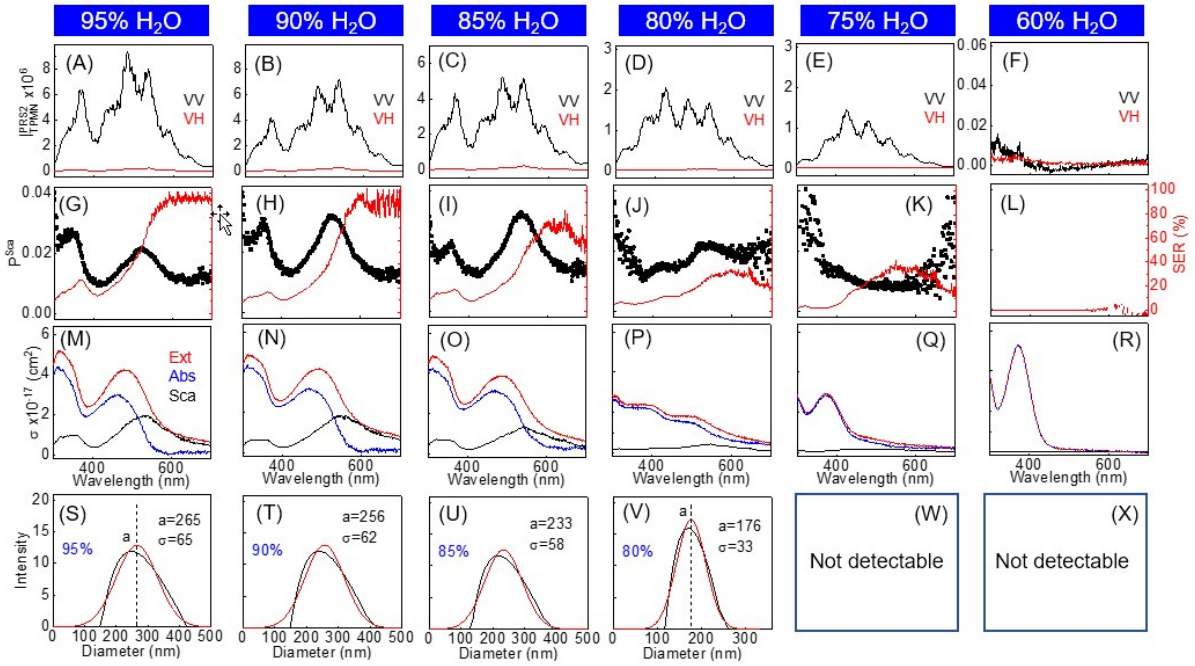

Figure S1. (1st row) PRS2 VV and VH spectra of aggregated TPMN in different water fractions. The spectra are taken with 4 mm x 4 mm cuvette with 1 nm slit width to avoid signal saturation. All spectra are IFE-corrected and solvent- cuvette- background corrected. (2nd row) scattering depolarization and scattering-to-extinction (SER) spectra. (3rd row) Extinction, absorption and scattering cross-section spectra normalized by nominal concentration for each TPMN molecules. (4th row) DLS data. The data is fitted with Gaussian distribution with the indicated mean and standard deviation

2. UV-vis, SSF, and PAOS spectra of water series samples

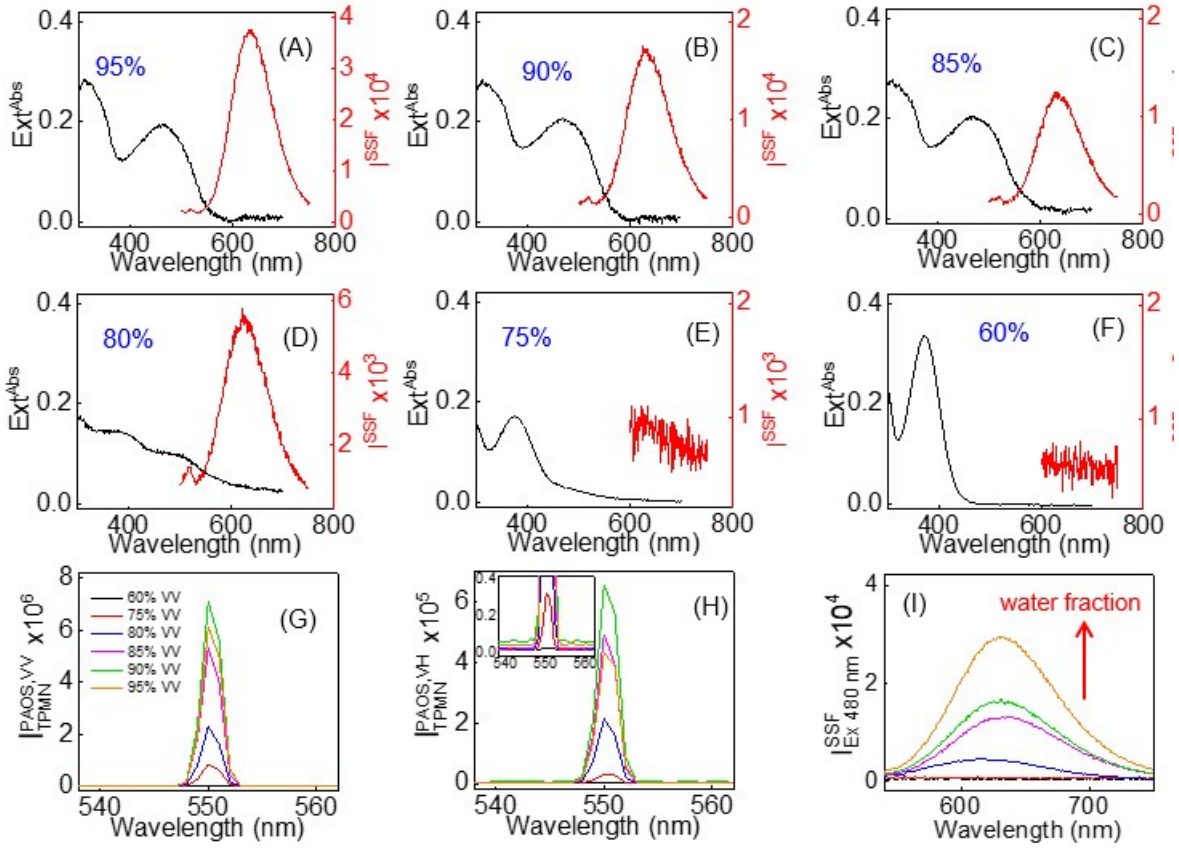

Figure S2. UV-vis absorption and SSF spectra of 25 μM aggregated TPMN in (A) 95%, (B) 90%, (C) 85%, (D) 80%, (E) 75%, and (F) 60% water. (G) PAOS VV spectra and (H) PAOS VH spectra of water series samples excited at 550 nm where their respective UV-vis spectrum overlaps with SSF spectrum (A-F). Inset in (H) is the zoom-in of PAOS VH showing no fluorescence contribution. All PAOS signal is attributed to scattering with no ORF detected. (I) As-acquired SSF spectra for water fraction series samples.

3. PRS2 data analysis and DLS data for TPMN concentration series samples

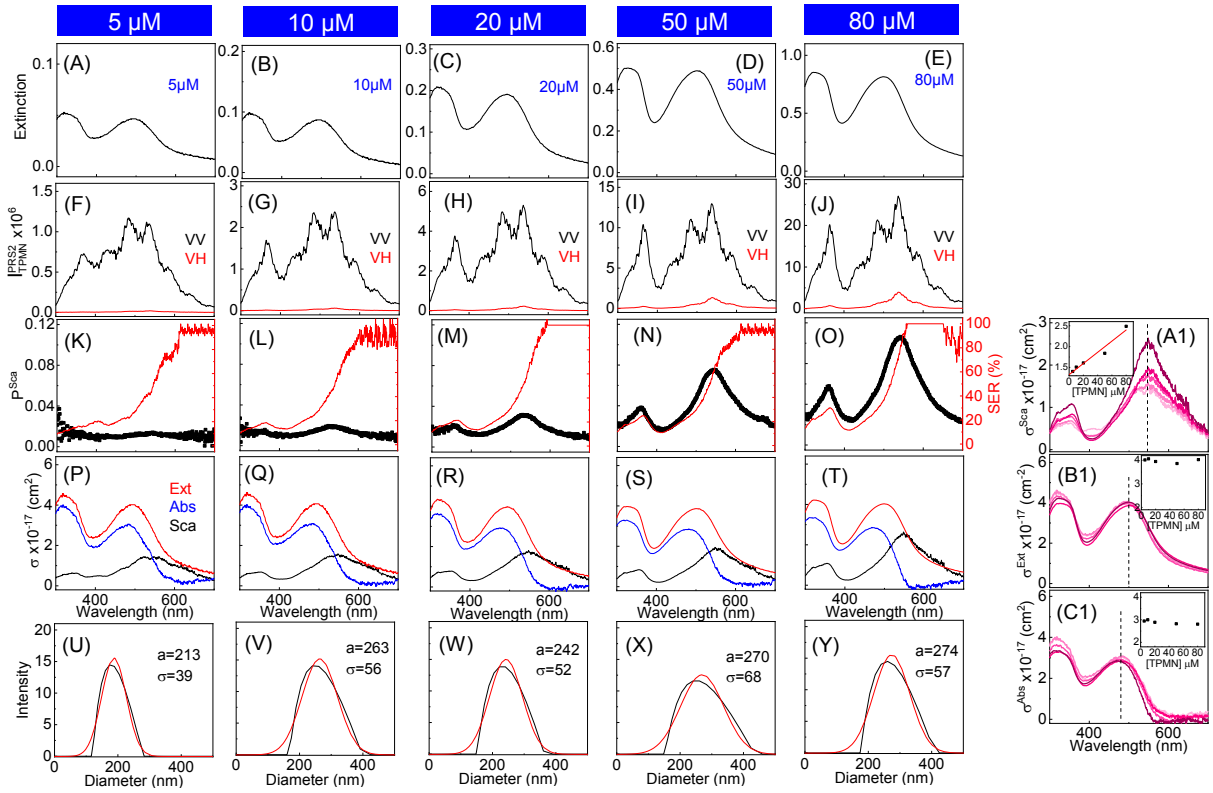

Figure S3. (1st row, A-E) UV-vis extinction spectra for aggregated TPMN with different concentrations highlighted on top. (2nd row, F-J) PRS2 VV and VH spectra. The spectra are taken with 4 mm x4 mm cuvette with 1 nm slit width to avoid signal saturation. All spectra are IFE-corrected and solvent- cuvette- background corrected. (3rd row, K-O) scattering depolarization and scattering-to-extinction (SER) spectra. (4th row, P-T) Extinction, absorption and scattering cross-section spectra normalized by nominal concentration for each TPMN molecules. (5th row, U-Y) DLS data. (A1-C1) Reorganized cross-section data from (P) to (T): (A1) Scattering cross-section, (B1) extinction cross-section, and (C1) absorption cross-section spectra of different DPMN concentrations. (Insets) the cross-section at the wavelengths indicated with dash lines as a function of DPMN concentration

4. As-acquired spectra of the TPMN aggregates as function of the sample incubation

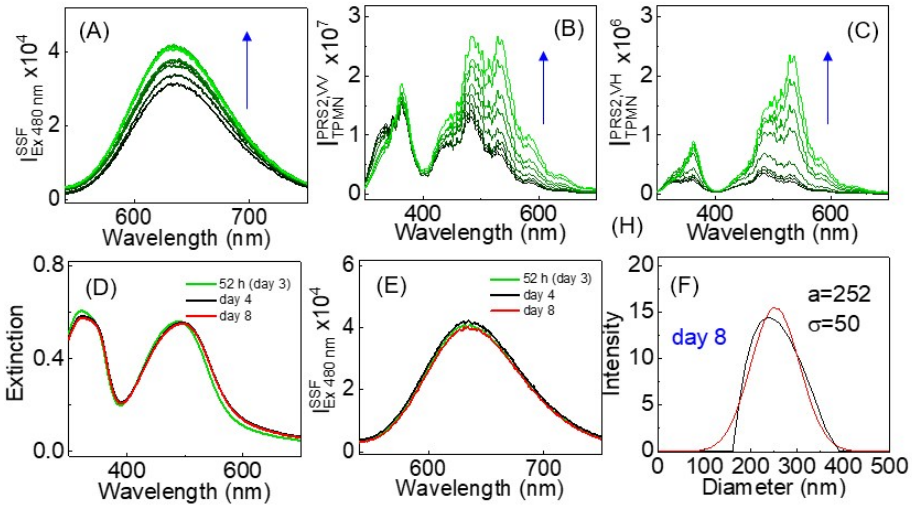

Figure S4. (A) as-acquired SSF, (B) PRS2 VV and (C) PRS2 VH spectra of 60 μM aggregated TPMN in 90% water mixture as incubation time lasts from 10 minutes to 52 hours. The PRS2 spectra were acquired in a 10 mm ×10 mm cuvette with 1 nm slit width. (D) Comparisons of UV-vis extinction spectra of TPMN incubated for 52 hours, 4 days and 8 days. The ones at 4 days and 8 days overlaps with each other. (E) As-acquired SSF spectra of TPMN incubated for 52 hours, 4 days and 8 days. (F) DLS data for aggregated TPMN after 8-day incubation. The red line is curve-fitting with a Gaussian distribution with the specified mean a and standard derivation of σ.

5. Photographs and as-acquired data for disaggregation of TPMN aggregates

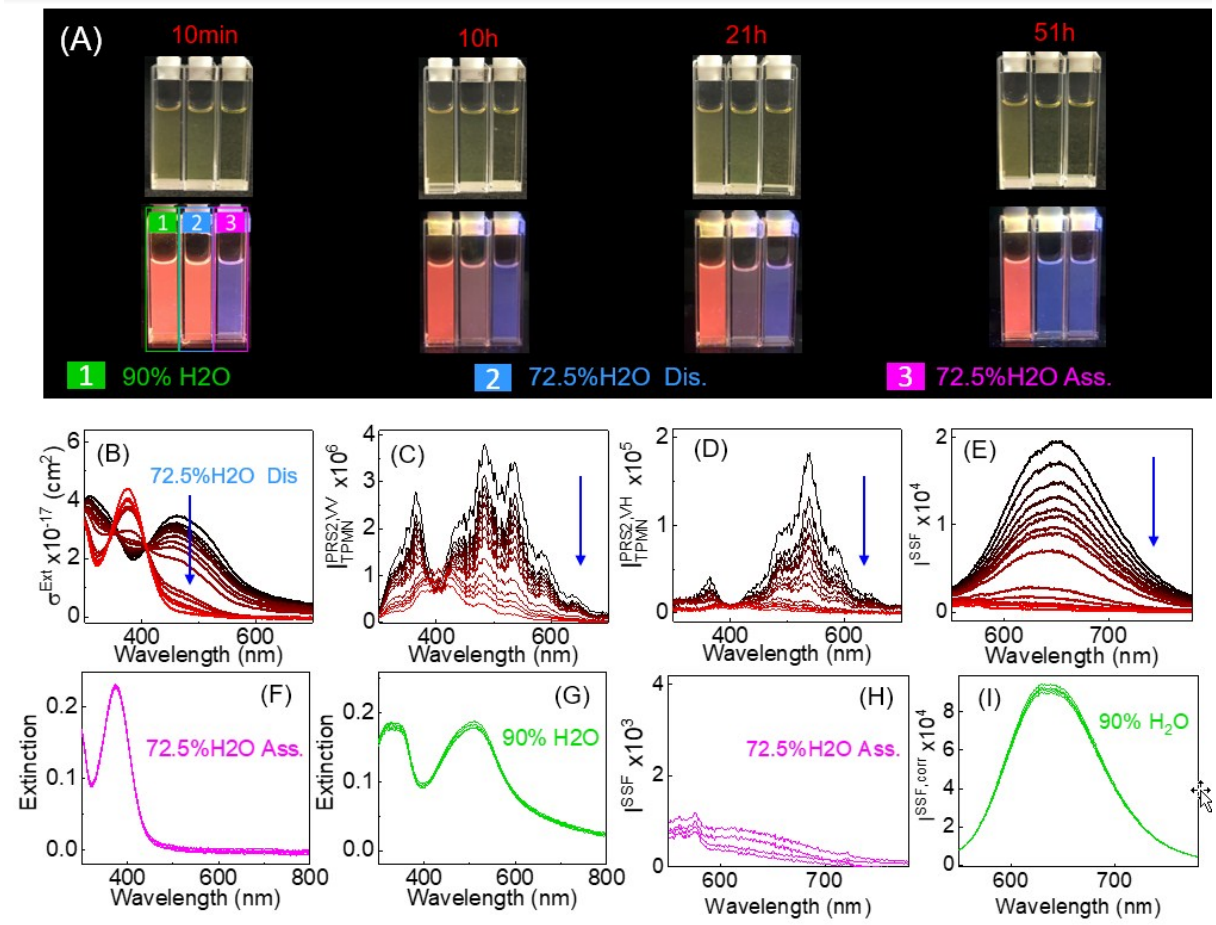

Figure S5. (A) White light and fluorescence photographs of samples at different time points: 20 μM TPMN (left) in 90% H_2O, (middle) disassembling in 72.5% H_2O and (right) assembling in 72.5% H_2O. (B) Extinction cross-section, (C) PRS2 VV, (D) PRS2 VH and (E) as-acquired SSF spectra of disassembling sample at different incubation time. The PRS2 spectra were acquired in a 10mm x 10mm cuvette with 1 nm slit width. Extinction spectra of (F) 72.5% H_2O assembly TPMN and (G) 90% water TPMN sample. SSF spectra of (H) 72.5% H_2O assembly TPMN and (I) 90% water TPMN sample at different incubation time.