Supporting Information

Characterization of conjugate between poly (N-vinyl caprolactam) and triazine-based covalent organic framework as potential biomaterial

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Experimental Details:

Materials: Trifluoromethanesulfonic acid, p-Aminobenzonitrile, cynauric chloride, and 8-anilinonaphthlene-1-sulfonic acid (ANS) were obtained from Sigma-Aldrich Pvt. Ltd. DIPEA was obtained from Tokyo Chemical Industry India Pvt. Ltd. Tetrahydrofuran (THF) and methanol were obtained from Thermo Fischer Scientific India Pvt. Ltd. All other materials used were of analytical grade. The solvents and chemicals were used as received. Double distilled water has been used to prepare samples and washing glassware obtained from Merck Millipore at USIC, University of Delhi, India. Synthesized PVCL as per the synthesis method reported in the literature was used.[1]

Instrumentation: Instruments used for characterization were as follows: Thermo Fisher Nicolet iS50 FTIR spectrometer was used for obtaining FTIR spectra. Bruker High-Resolution D8 Discover X-Ray Diffractometer was employed for recording the XRD pattern. Physical Electronics, PHI 5000 VersaProbe III X-ray photoelectron spectroscope was used to obtain the XPS spectra. TEM micrographs were obtained through Thermo Scientific, Cryo-TEM (TALOS S) Transmission electron microscope. SEM micrographs and elemental mapping were obtained using Zeiss GeminiSEM 500 with EDS detector Field Emission Scanning Electron microscope (FESEM). Fluorescence spectra were recorded on Cary Eclipse fluorescence spectrofluorometer (Varian optical spectroscopy instruments, Mulgrave, Victoria, Australia) equipped with an intense xenon flash lamp as the light source. PMT voltage was 720 V, slit width was 10/10 nm and temperature was kept constant at 25 °C using a Peltier device. To assess the hydrodynamic diameter (d_H) as a function of temperature the Zetasizer Nano ZS90 dynamic light scattering (DLS) instrument (Malvern Instruments Ltd., UK) was used. The device has a 4 Mw He-Ne laser with a fixed wavelength of 633 nm. Zeta potential measurements were also performed on Zetasizer Nano ZS90 instrument using DTS1070 disposable cuvettes. For recording the AFM images, Witec GmbH AFM (Germany) instrument was utilized. For sample preparation, 10 µL samples were drop cast on a freshly cleaved mica sheet and then air dried. All the images were apprehended in the tapping mode with a cantilever. The resonance frequency was set at 80 kHz while the force S3 constant was kept 40 N/m.

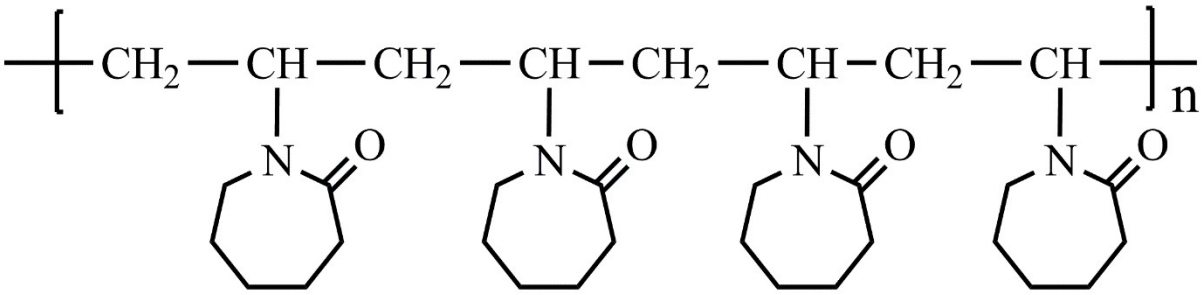

Fig S1. Chemical structure of poly(N-vinyl caprolactam) (PVCL).

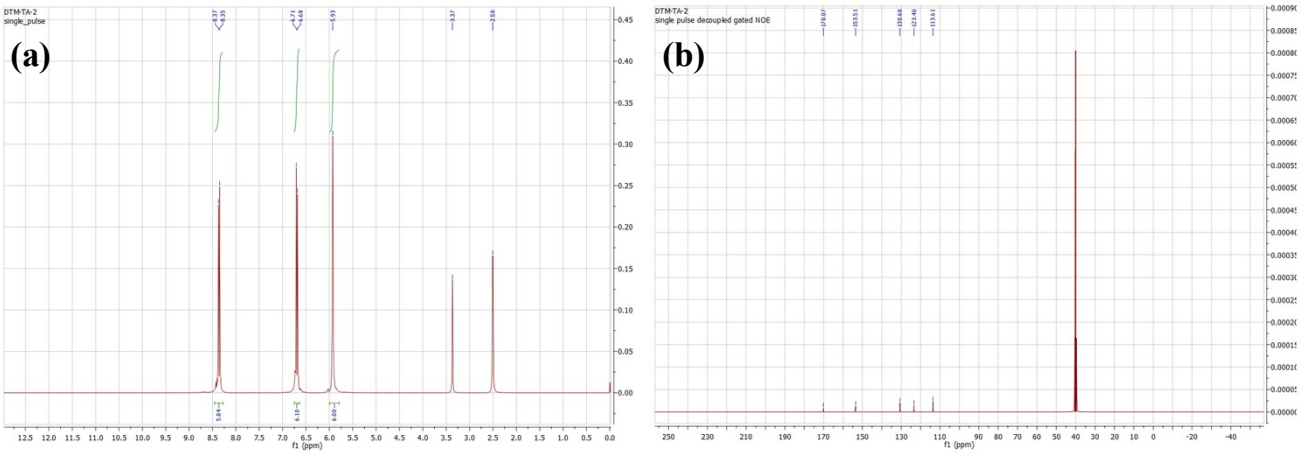

Fig S2. NMR spectrum of TAPT **(A)** ^{1}H, and **(B)** ^{13}C.

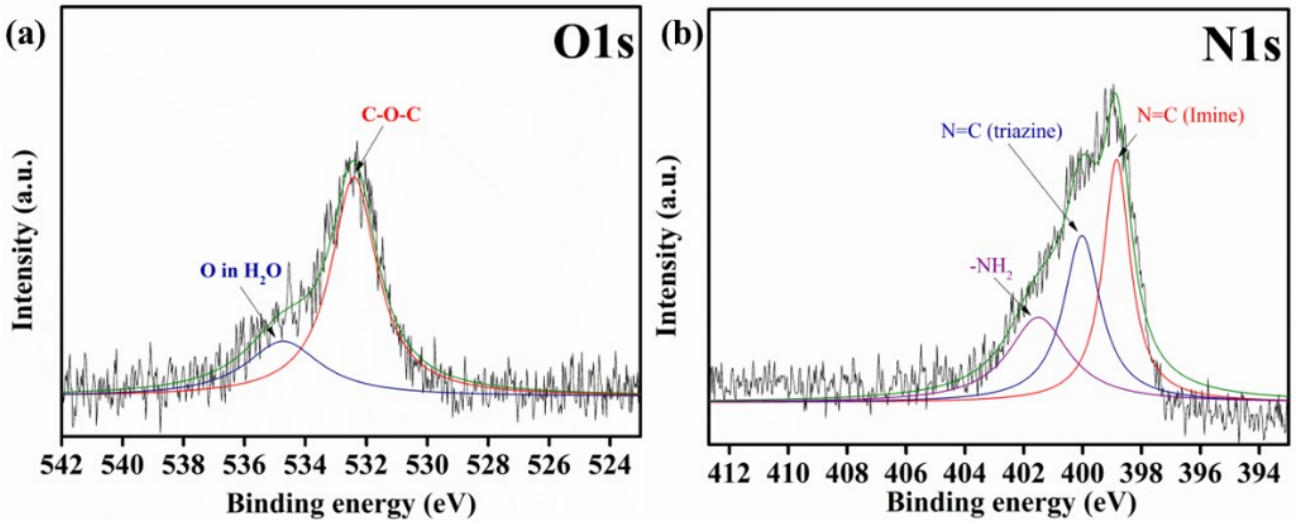

Fig S3. Deconvoluted XPS (a) O1s and (b) N1s spectrum of CC-TAPT-COF.

Table S1. Phase transition temperatures of PVCL in the presence of CC-TAPT-COF by Thermal Fluorescence Spectroscopy.

Concentration of CC-TAPT-COF (mg/mL)	LCST (˚C)
0.000	31.00 ± 0.31
0.025	30.97 ± 0.30
0.050	30.91 ± 0.29
0.150	30.87 ± 0.25
0.250	30.57 ± 0.21

Table S2. Phase transition temperatures of PVCL in the presence of CC-TAPT-COF by DLS.

Concentration of CC-TAPT-COF (mg/mL)	LCST (˚C)
0.000	31.00 ± 0.31
0.025	30.50 ± 0.28
0.050	30.27 ± 0.27
0.150	30.18 ± 0.25
0.250	29.25 ± 0.23

References

1 K. Kumar, R. Yadav and P. Venkatesu, *J. Phys. Chem. B*, 2019, **123**, 6331–6344.