Electronic supplementary Information

Pyrene-Fluorescein based colour-tunable AIE active hybrid fluorophore material for potential live cell imaging application

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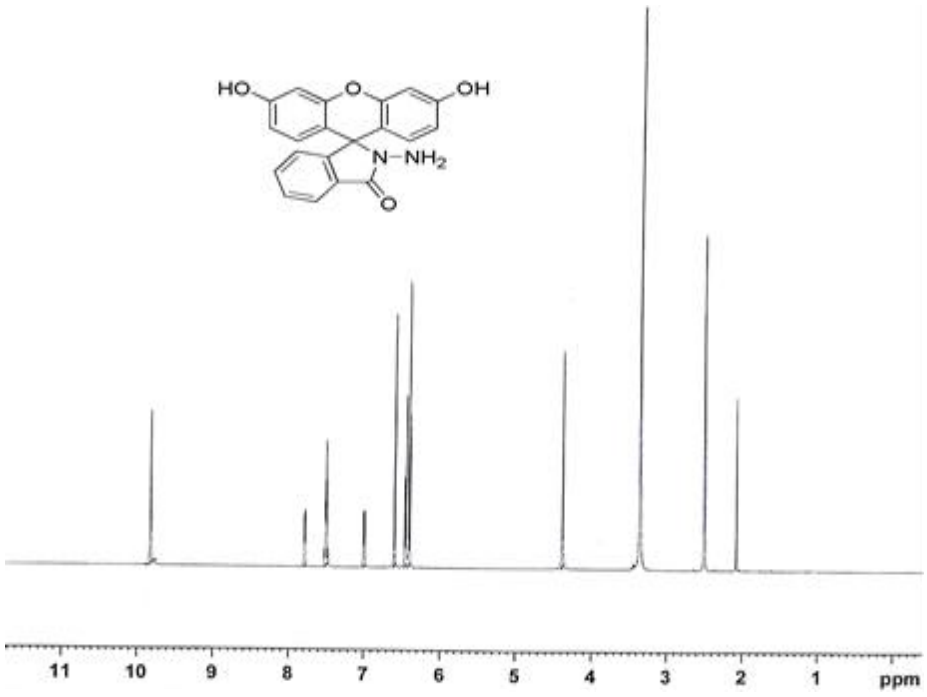
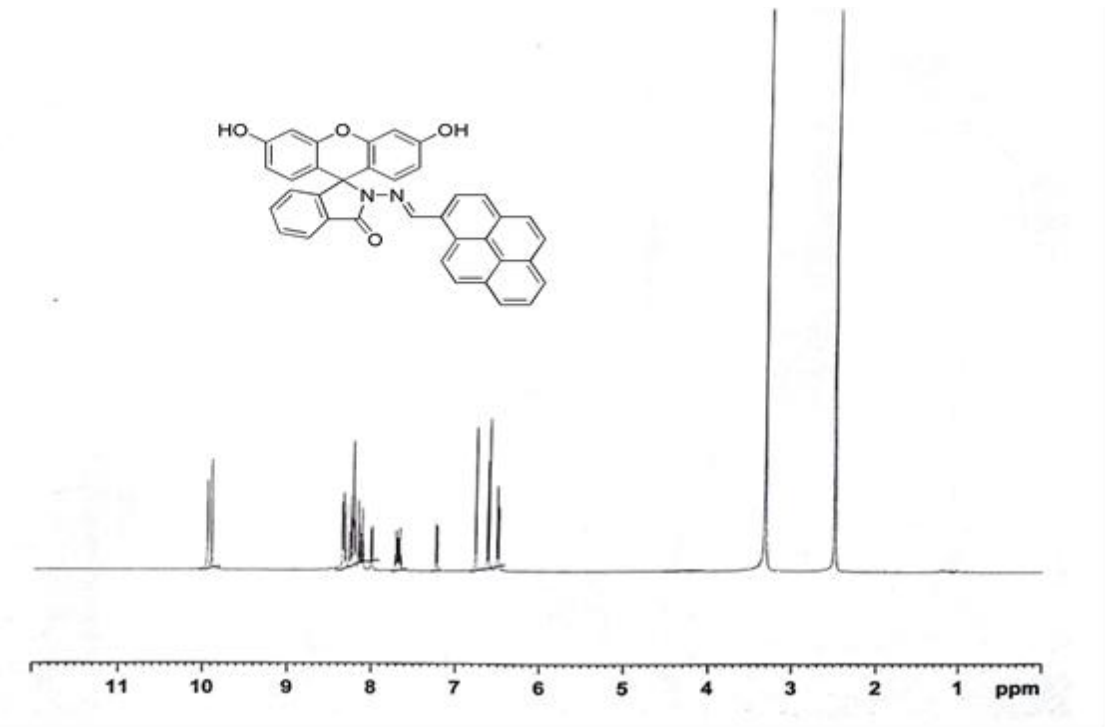


Fig. S1 ^{1}H NMR spectra of precursor FH in DMSO-d_6.



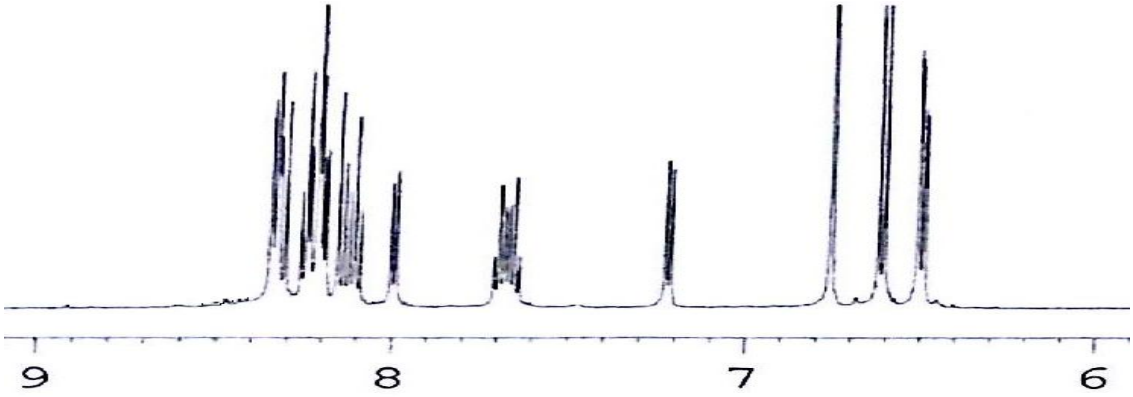


Fig. S2 ^{1}H NMR spectra of FHPY in DMSO-d_6 (upper) full spectrum and (lower) expanded aromatic region.

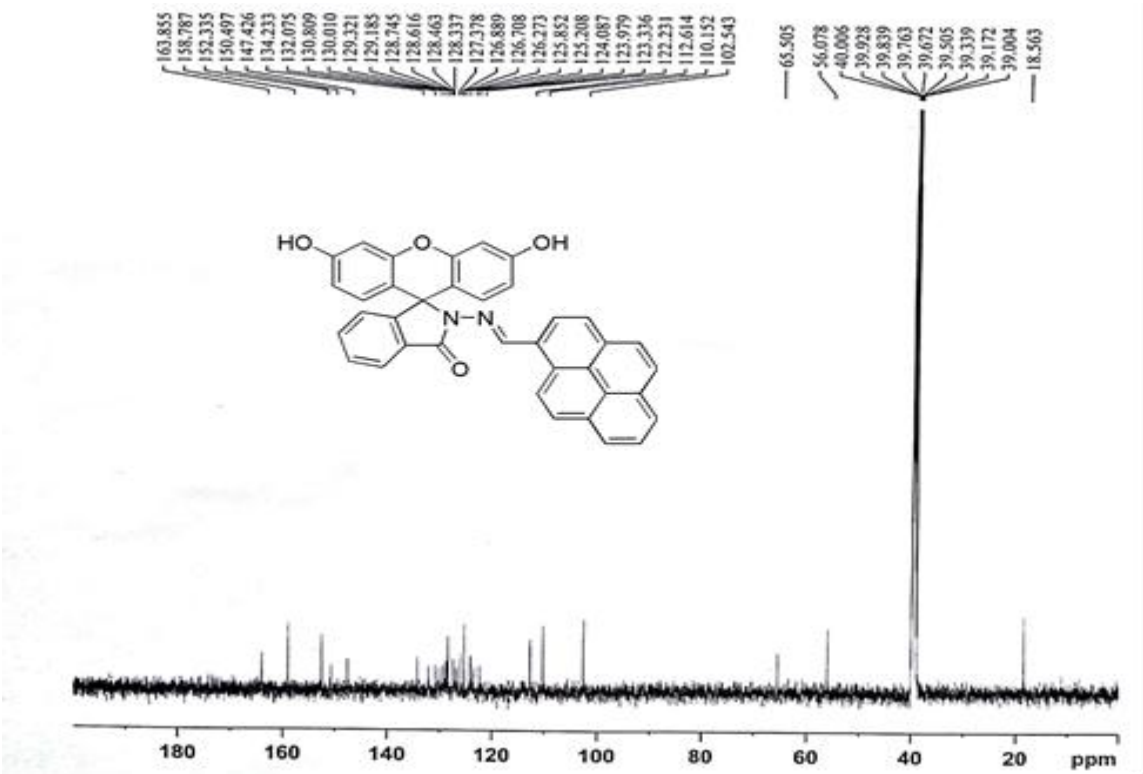


Fig. S3 ^{13}C NMR spectra of FHPY in DMSO-d_6

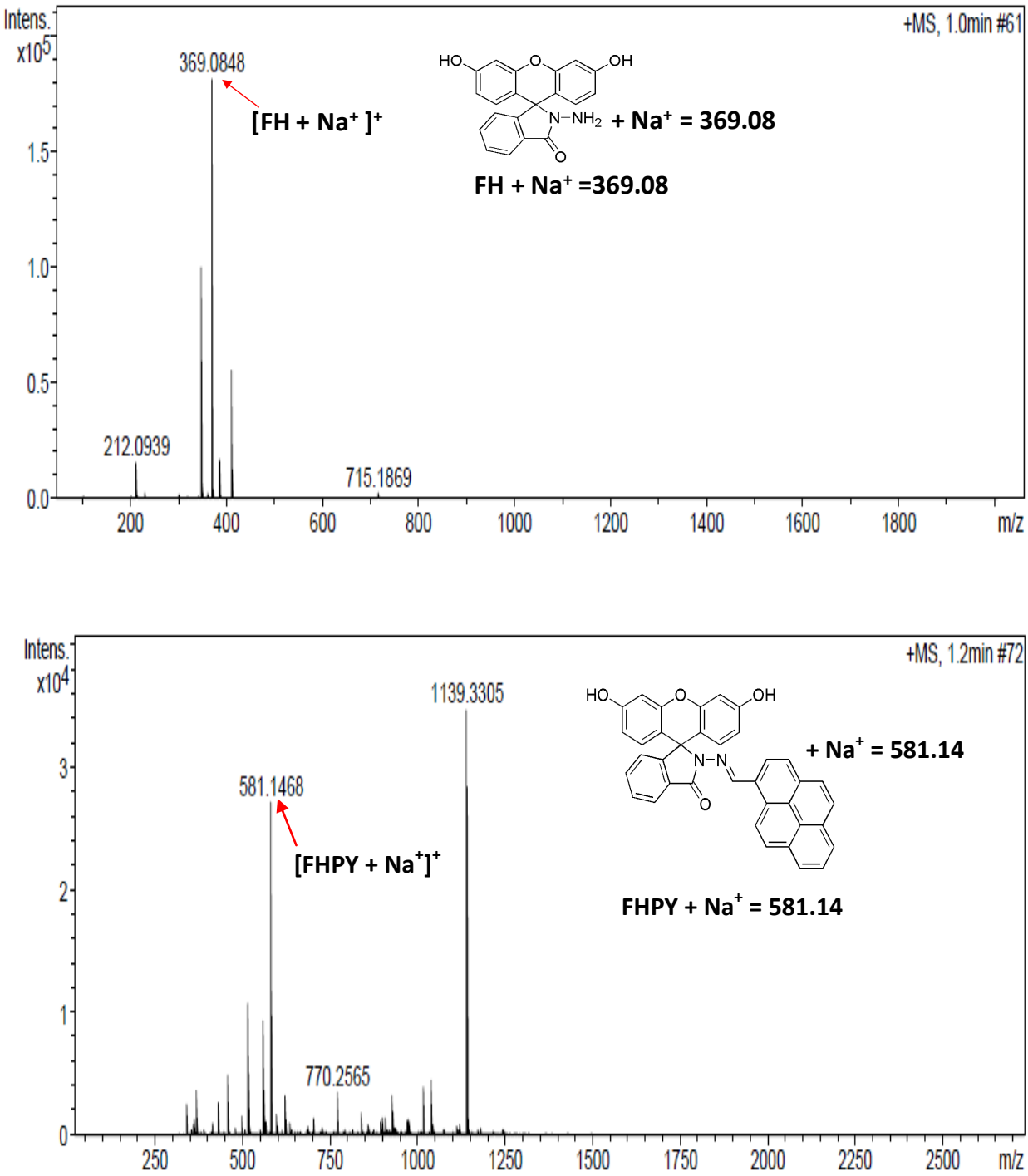


Fig. S4 HR mass spectra of (upper) FH and (lower) FHPY along with their calculated molecular ion.

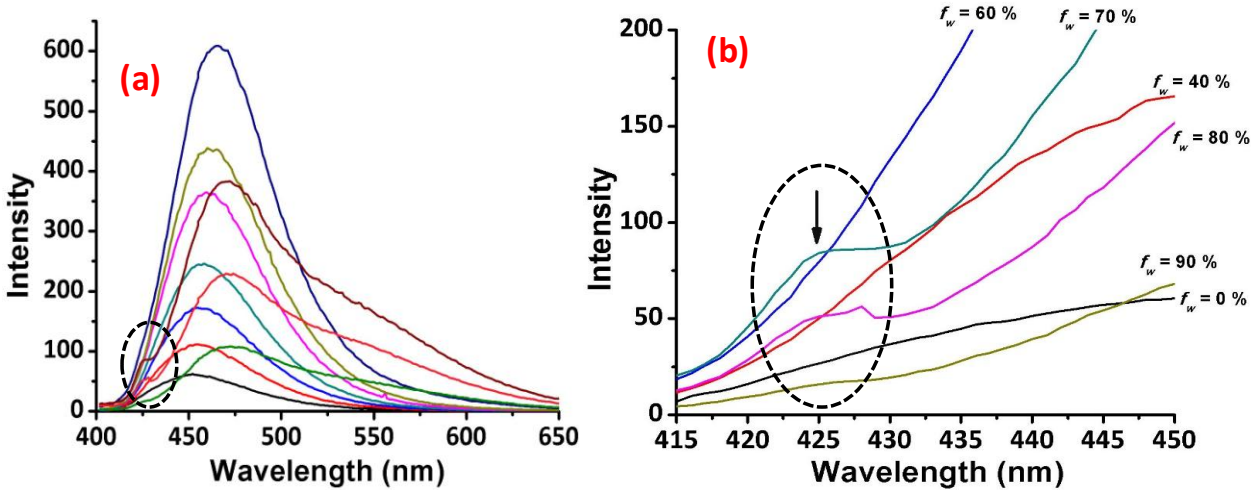


Fig. S5 (a) Emission spectra of FHPY at different volume fraction of water and (b) zoom in spectra showing pyrene monomer emission for 70-90% water fraction at 425 nm.

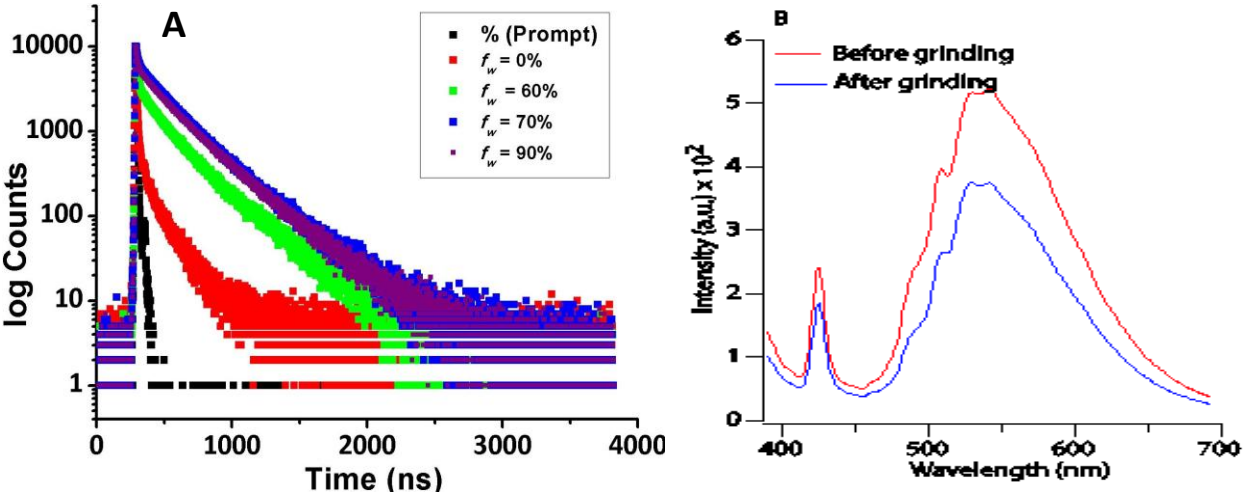


Fig. S6 (A) Fluorescence decay curves of FHPY at various water fractions f_w = 0, 60, 70 and 90 % and **(B)** Solid state fluorescence spectra before (red line) and after grinding (blue line) at λ_{ex}= 371 nm.

Table S1. Details of lifetime measurement of PHPY at 0, 60, 70, 90% water fractions along with average lifetime, χ^2 and weightage of tri-exponential best fit components.

FHPY at F_w = (vol %)	Average lifetime (ns)	Chi-square	Components of life time (ns) and Weight %
0 %	0.06	1.43	$\tau_1 = 0.06$ (21.21%) $\tau_2 = 2.24$ (77.24%) $\tau_3 = 0.04$ (1.53%)
60%	0.50	1.19	$\tau_1 = 1.89$ (28.98%) $\tau_2 = (4.54$ (69.57%) $\tau_3 = 0.09$ (1.44%)
70%	0.96	1.25	$\tau_1 = 2.26$ (32.66%) $\tau_2 = 4.58$ (66.21%) $\tau_3 = 0.07$ (1.11%)
90%	0.70	1.28	$\tau_1 = 1.87$ (30.03%) $\tau_2 = 4.32$ (69.05%) $\tau_3 = 0.05$ (0.09%)

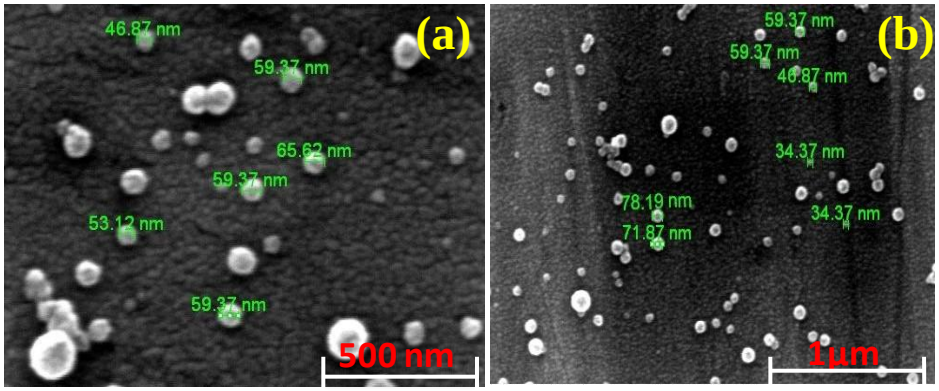


Fig. S7 SEM images (**a**) and (**b**) showing size of nanoaggregates at (f_w = 60% & 70%), respectively.

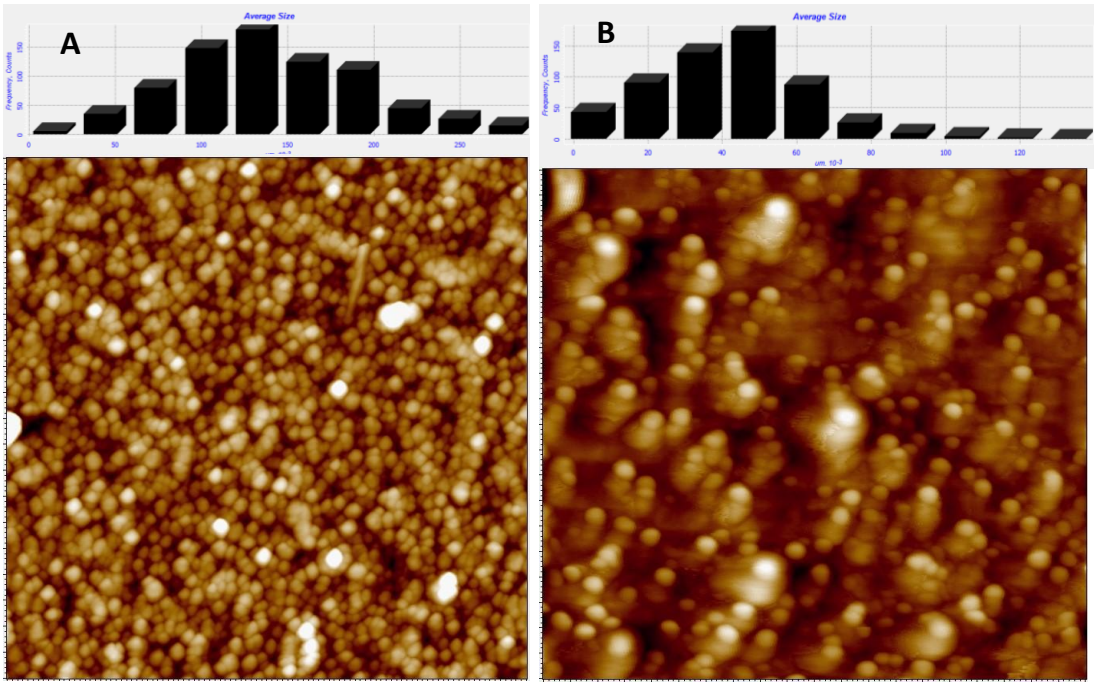


Fig. S8 AFM images along with size distribution plots of nano aggregates at (**A**) 60% and (**B**) 70% fraction of water. Average size distribution from AFM images at 60% and 70% obtained 120 nm and 50 nm, respectively.

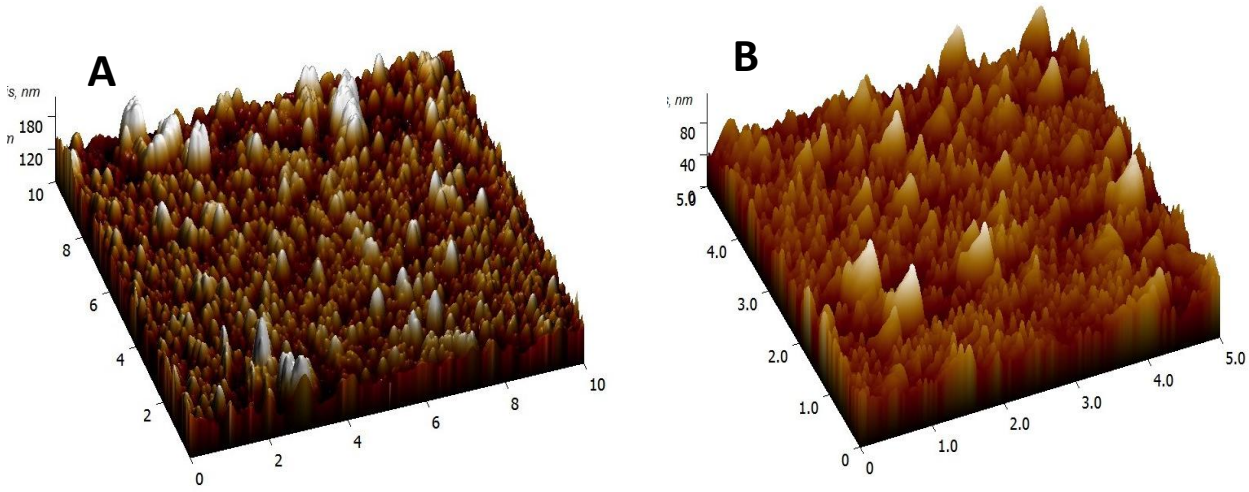


Fig. S9 AFM derivative three dimensional images showing the surface roughness of nano aggregates at (upper) 60% and (lower) 70% ratio of water. The surface roughness at *fw*= 70% reveals the smaller size than sample at 60% water fraction, except few unusual spikes.