Electronic supporting information

Sustainable processing and synthesis of non-toxic and antibacterial magnetic nanocomposite from spider silk in neoteric solvents

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Table S1: Elemental analyses of spider silk fibres before and after degumming.

Entry	Spider silk fiber	C%	H%	N%	S%
1	Pure spider silk fibre	34.45	6.18	3.07	0.72
2	Degummed spider silk fibre	46.32	6.49	1.04	0.25

Figure S1: Photograph showing gummy nature of naturally collected spider silk fiber.

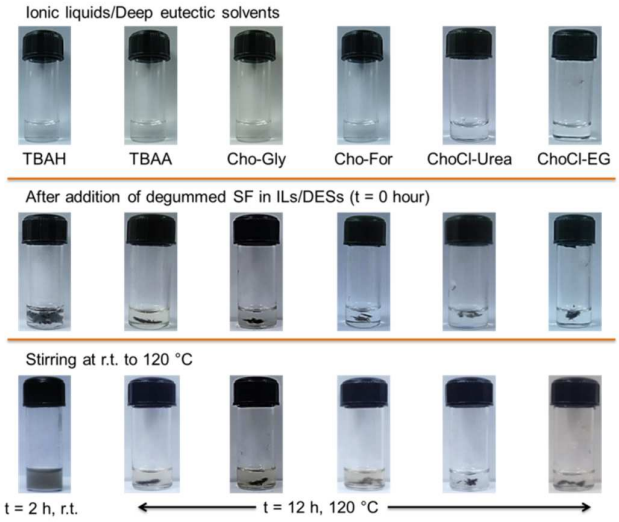


Figure S2: Optical images of nano-scale dispersion of degummed spider silk fiber in ILs/DESs

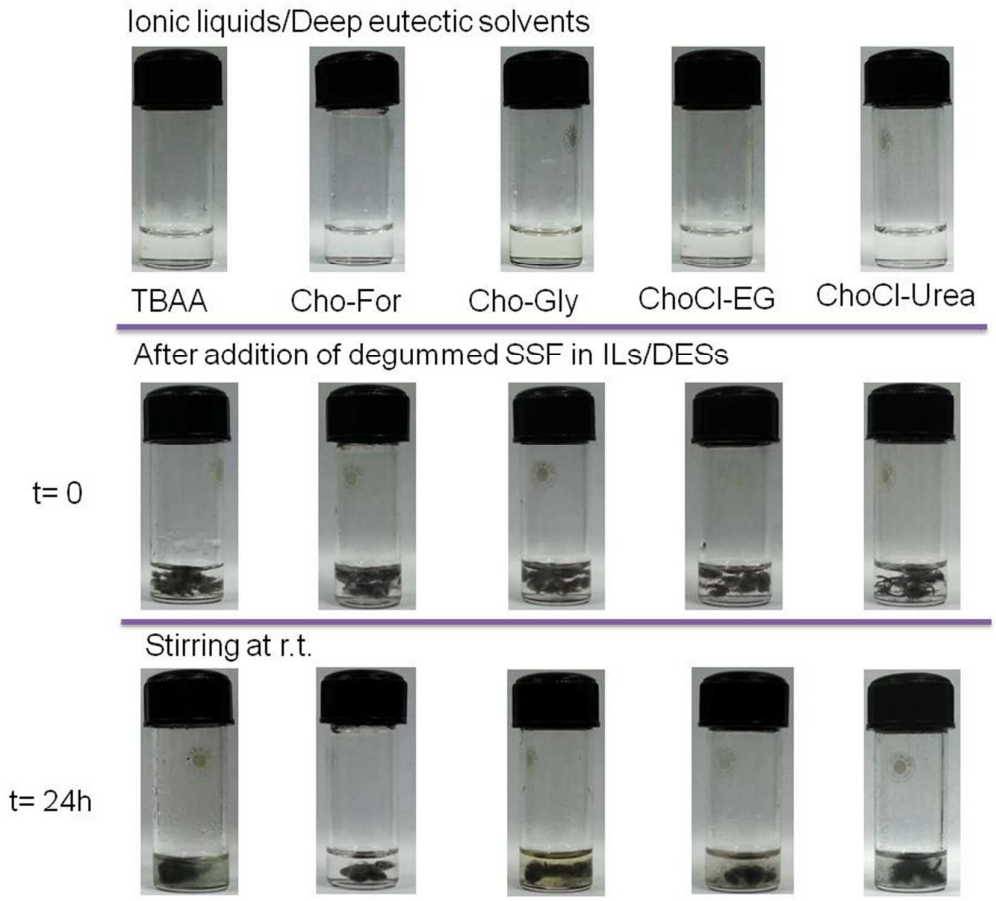


Figure S3: Optical images of dissolution of DSSF in various ILs/DESs in presence of 40% water.

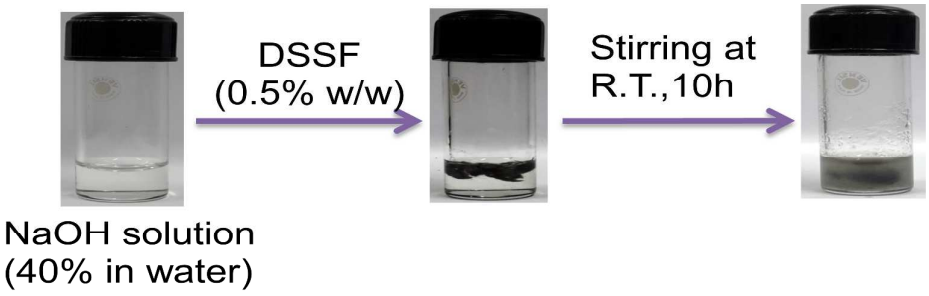


Figure S4: Degummed spider silk fiber dispersion in NaOH solution (40% in water)

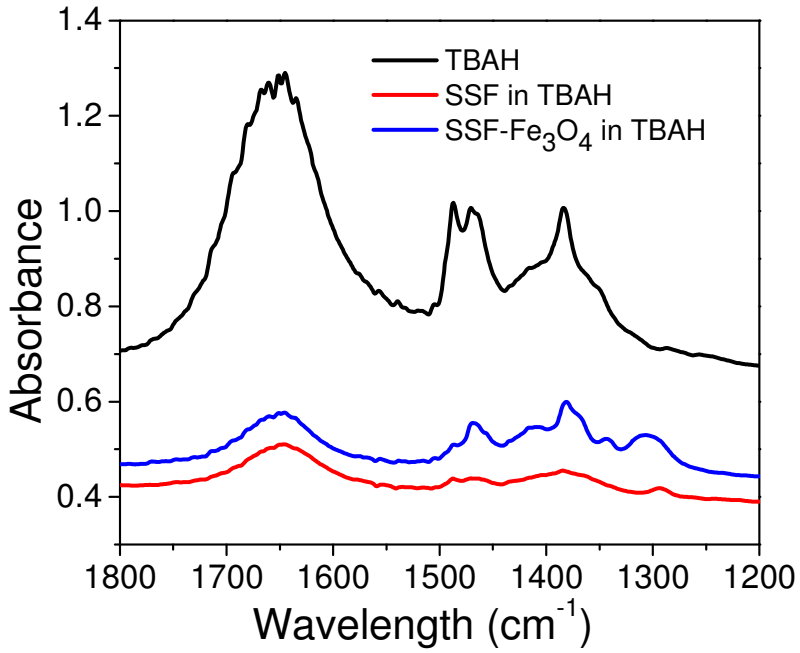


Figure S5: FT-IR of tetrabutylammonium hydroxide, degummed spider silk fiber solution in the ionic liquid and the magnetic bio-nanocomposite in the presence of the ionic liquid.

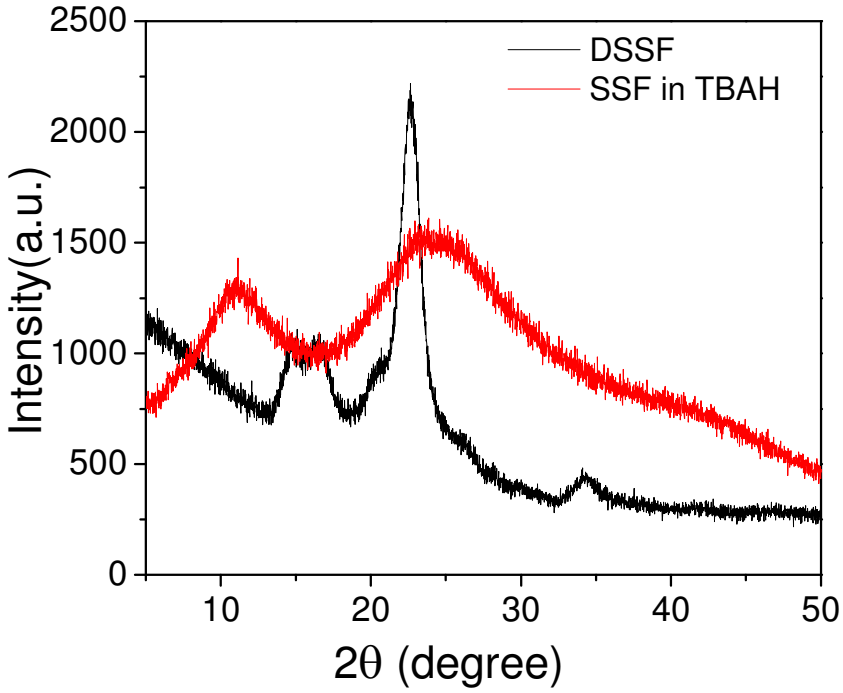


Figure S6: XRD spectra of degummed spider silk fiber and its solution in the ionic liquid.

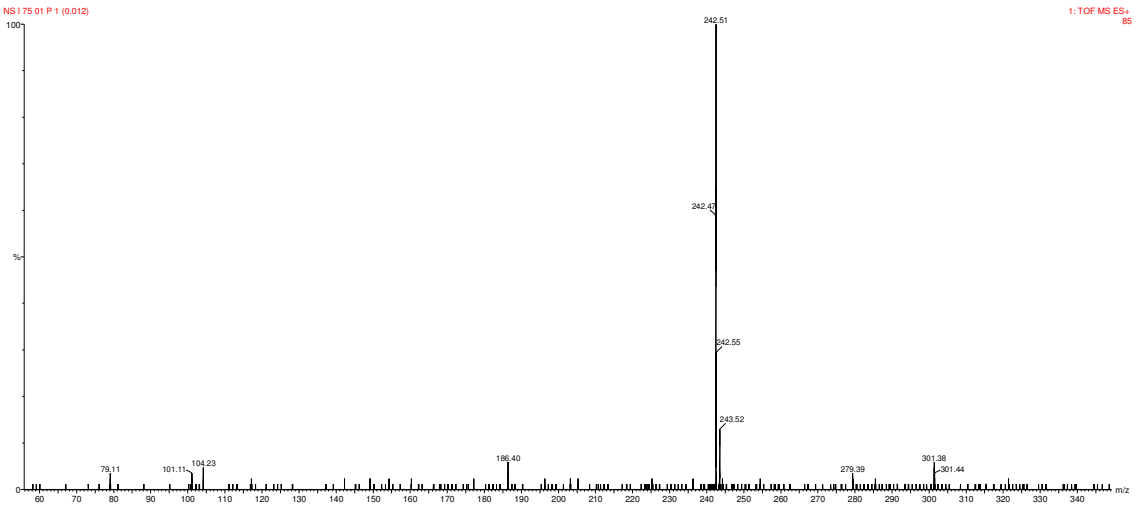


Figure S7: ESI-MS spectra of first IPA washing of regenerated spider silk.

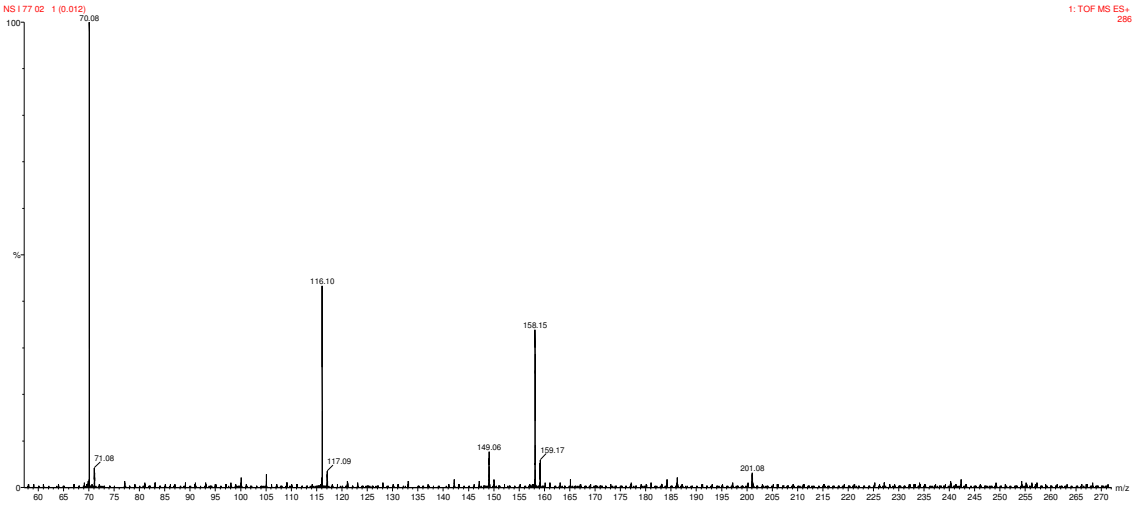


Figure S8: ESI-MS spectra of third IPA washing of regenerated spider silk.

Table S2: Elemental analyses of degummed silk fibres before and after regeneration.

Entry	Spider silk fiber	C%	H%	N%	S%
1	Degummed SSF	46.32	6.493	1.04	0.25
2	Regenerated SSF	37.36	6.311	1.01	0.14

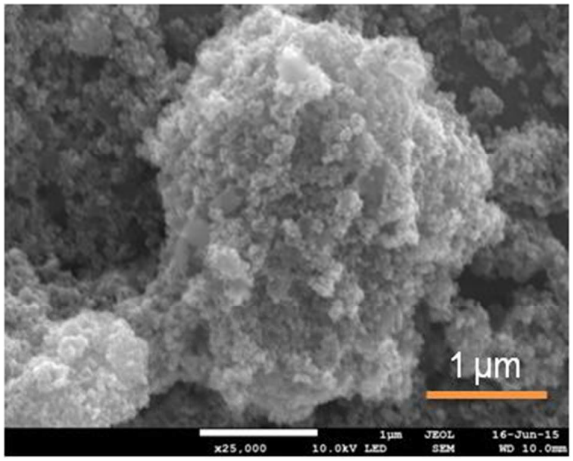
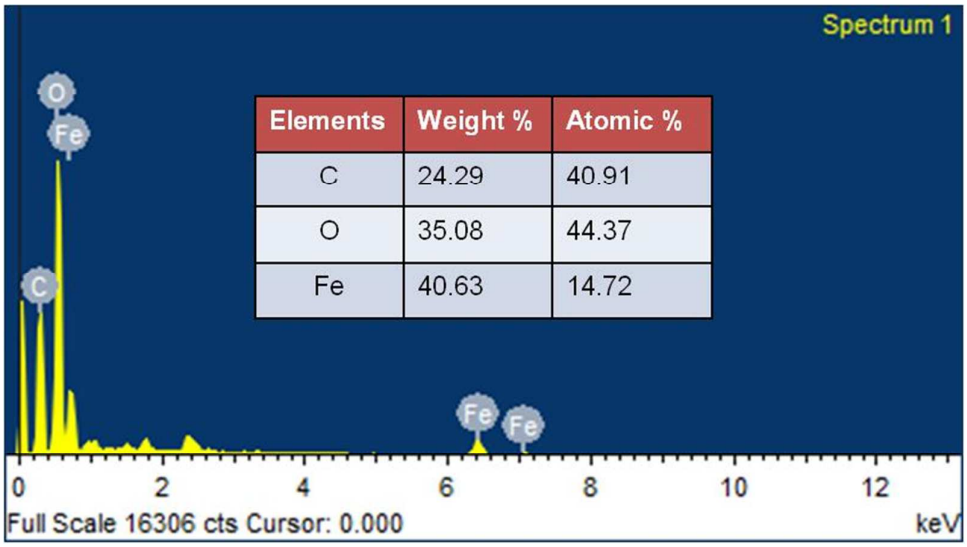


Figure S9**:** FE-SEM image of Fe_3O_4 particles.



Elements	Weight %	Atomic %
C	24.29	40.91
O	35.08	44.37
Fe	40.63	14.72

Figure S10**:** EDX profile of bio-nanocomposite