Electronic Supplementary Material (ESI) for Polymer Chemistry.

Construction of muscle-like metallo-supramolecular polymers from a pillar[5]arene-based [*c*2]daisy chain

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Electronic Supplementary Information

1. Materials and methods

All reagents were commercially available and used as supplied without further purification. Compounds **2**[S1], **3**[S1] and **4**[S2] were prepared according to published procedures.[S1] NMR spectra were recorded with an Agilent 600 MHz DD2 spectrophotometer, a Bruker Avance DMX 500 spectrophotometer, or a Bruker Avance DMX 400 spectrophotometer using the deuterated solvent as the lock and the residual solvent or TMS as the internal reference. MALDI-TOF mass spectrometry was performed on a Shimadzu Biotech AXIMA Performance instrument. UV-vis spectra were obtained on a UV-2550PC instrument. Titration experiments and Job plot were performed in quartz cuvettes scanning in the range of 250–700 nm. Transmission electron microscopy investigations were carried out on a JEM-1200EX instrument. Scanning electron microscopy investigations were carried out on a JEOL 6390LV instrument. Dynamic light scattering was carried out on a Malvern Nanosizer S instrument at room temperature.

*2. Characterization of compound **1***

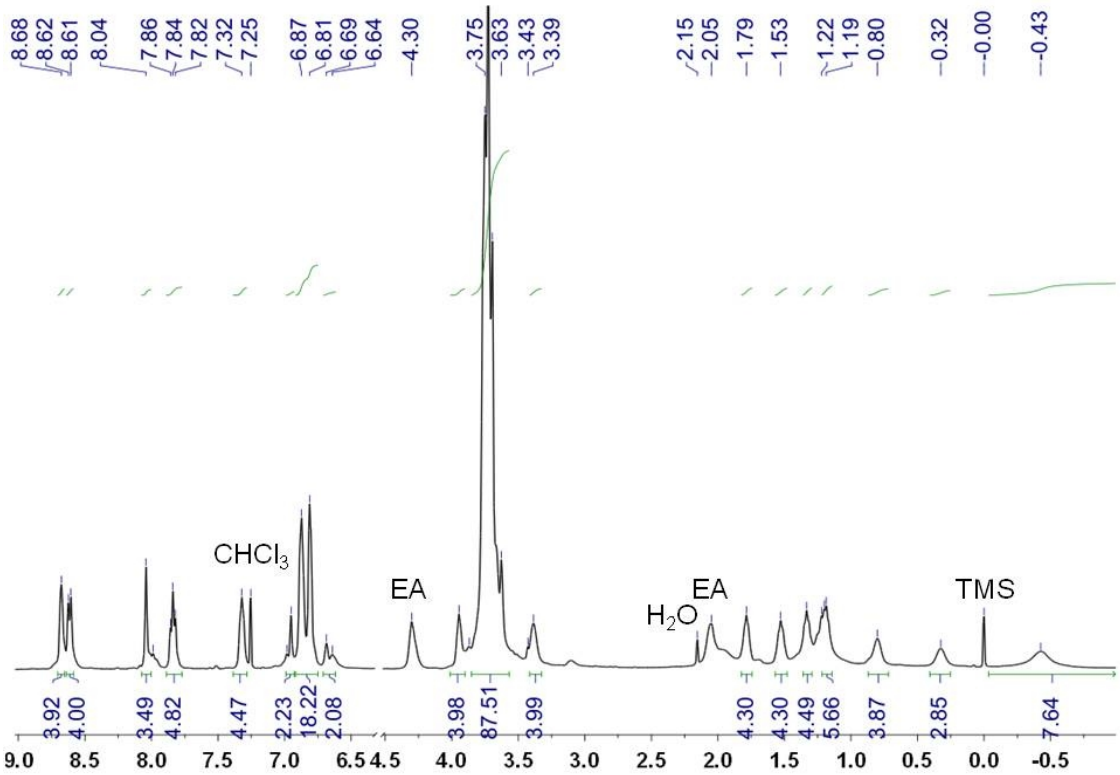

Fig. S1 ^{1}H NMR spectrum (400 MHz, $CDCl_3$, 298 K) of **1**.

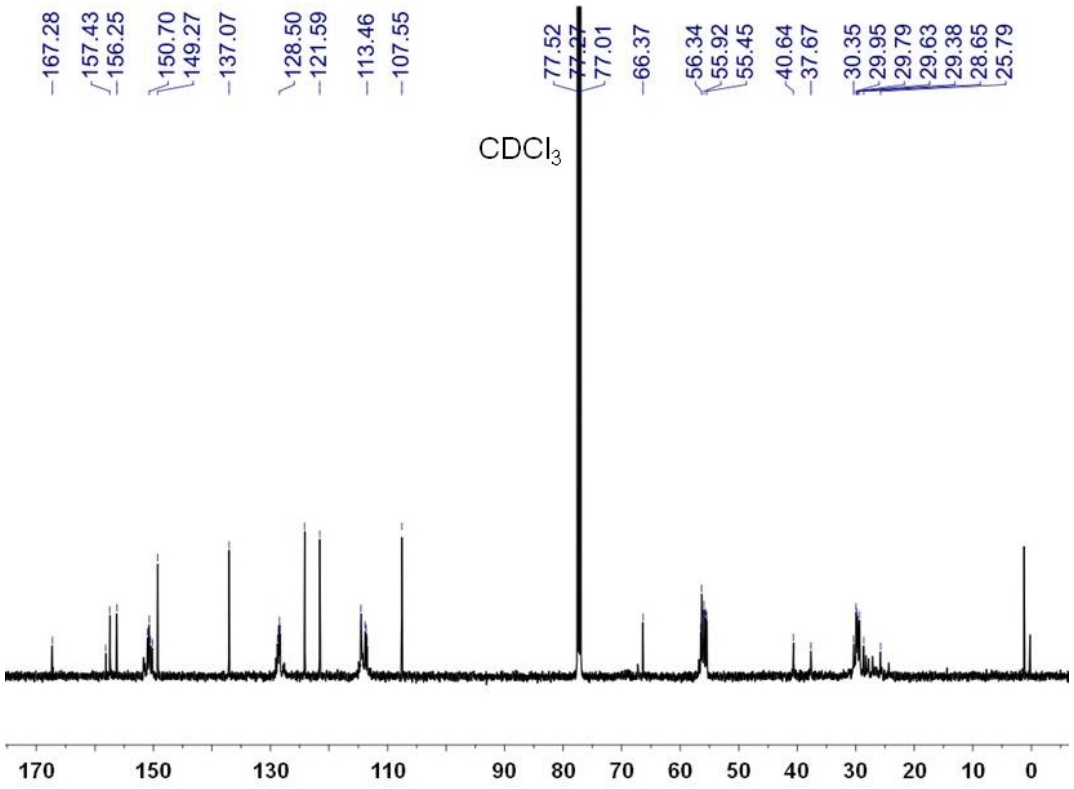

Fig. S2 ^{13}C NMR spectrum (125 MHz, $CDCl_3$, 298 K) of **1**.

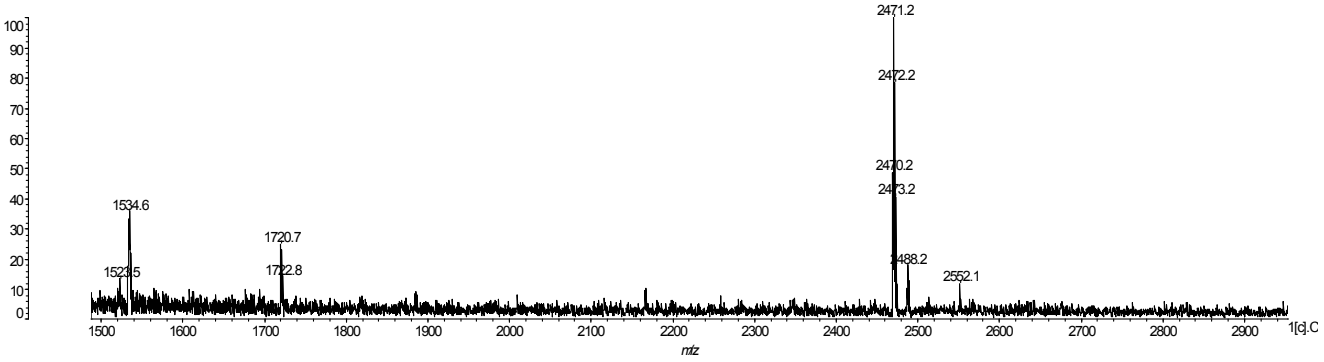

Fig. S3 MALDI-TOF mass spectrum of **1**. Assignment of the main peak: *m*/*z* 2471.2 $[M + Na]^+$ (100%).

*3. Self-assembly morphologies of polymer **Fe1** in different solvents*

The self-assembly morphologies of metallo-supramolecular polymer **Fe1** in different solvents [chloroform (Figure S4a and d), a mixture of chloroform and DMSO (v/v, 1:1) (Figure 3 and Figure S4b and e) and DMSO (Figure S4c and f)] with the same concentration of 1.00 mM were revealed by TEM and SEM. Both TEM (Figures 3 and S4a–c) and SEM (Figures 3 and S4d–f) results revealed that polymer **Fe1** formed filamentous structures with three different solvent compositions.

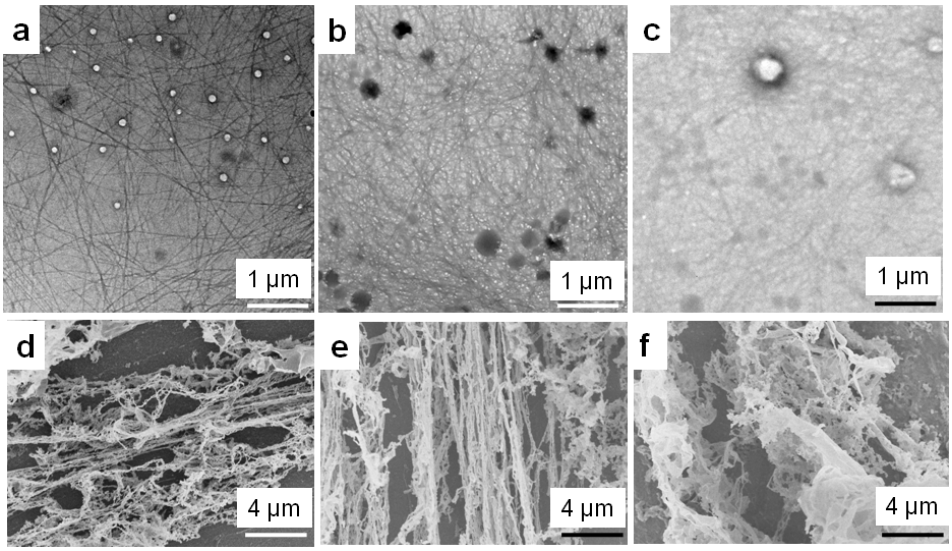

Fig. S4 (a, b and c) TEM and (d, e and f) SEM images of fibrous networks prepared from 1.00 mM **Fe1** in different solvents [chloroform (a and d), a mixture of chloroform and DMSO (v/v, 1:1) (b and e), and DMSO (c and f)].

References

1. Z. Zhang, C. Han, G. Yu and F. Huang, *Chem. Sci.*, 2012, **3**, 3026.
2. E. J. Cho, S. Jung, K. Lee, H. J. Lee, K. C. Nam and H.-J. Bae, *Chem. Commun.* 2010, **46**, 6557.
3. G. Du, E. Moulin, N. Jouault, E. Buhler and N. Giuseppone, *Angew. Chem. Int. Ed.*, 2012, **51**, 12504.