

Support information

Magnetic-field-controlled counterion migration within polyionic liquid micropores enables nano-energy harvest

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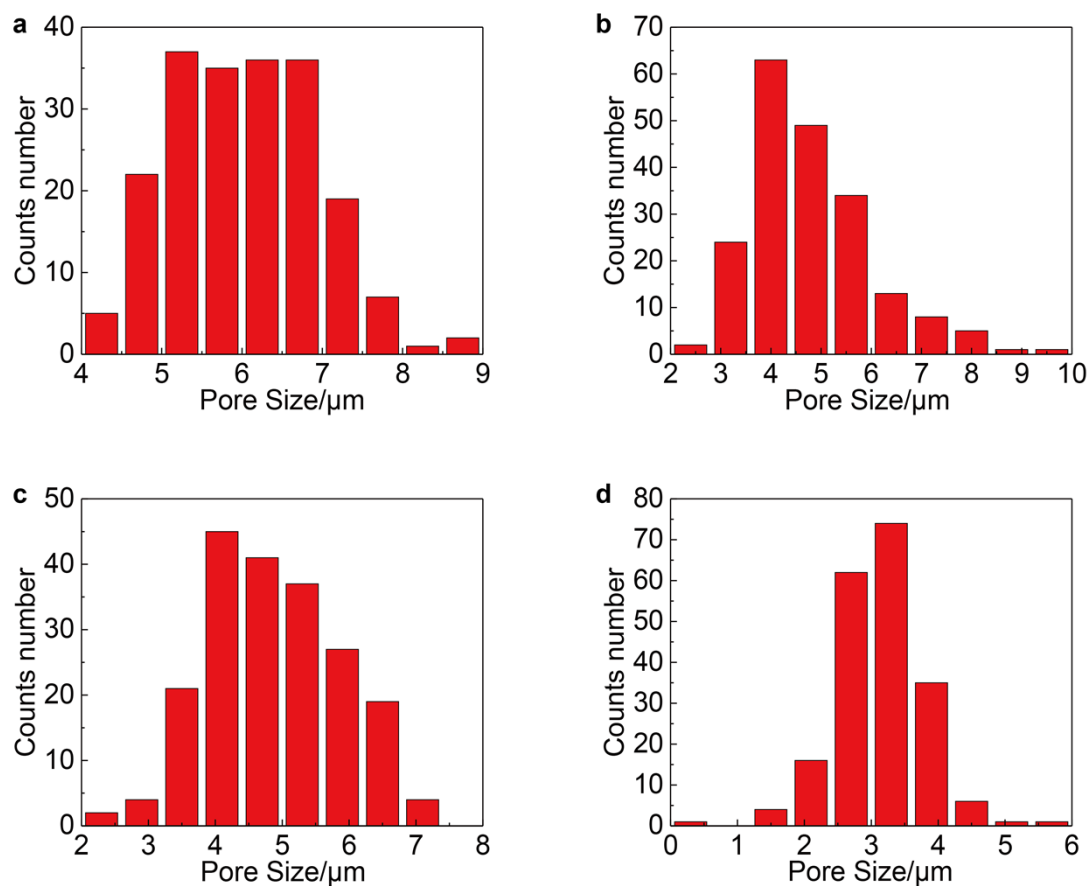


Fig. S1. Size distribution of PLM prepared with (a) 5 mg/mL, (b) 15 mg/mL, (c) 25 mg/mL, and (d) 45 mg/mL photoinitiator concentration. Other synthesis conditions: 3 hrs UV irradiation, 72 hrs water treatment under room temperature.

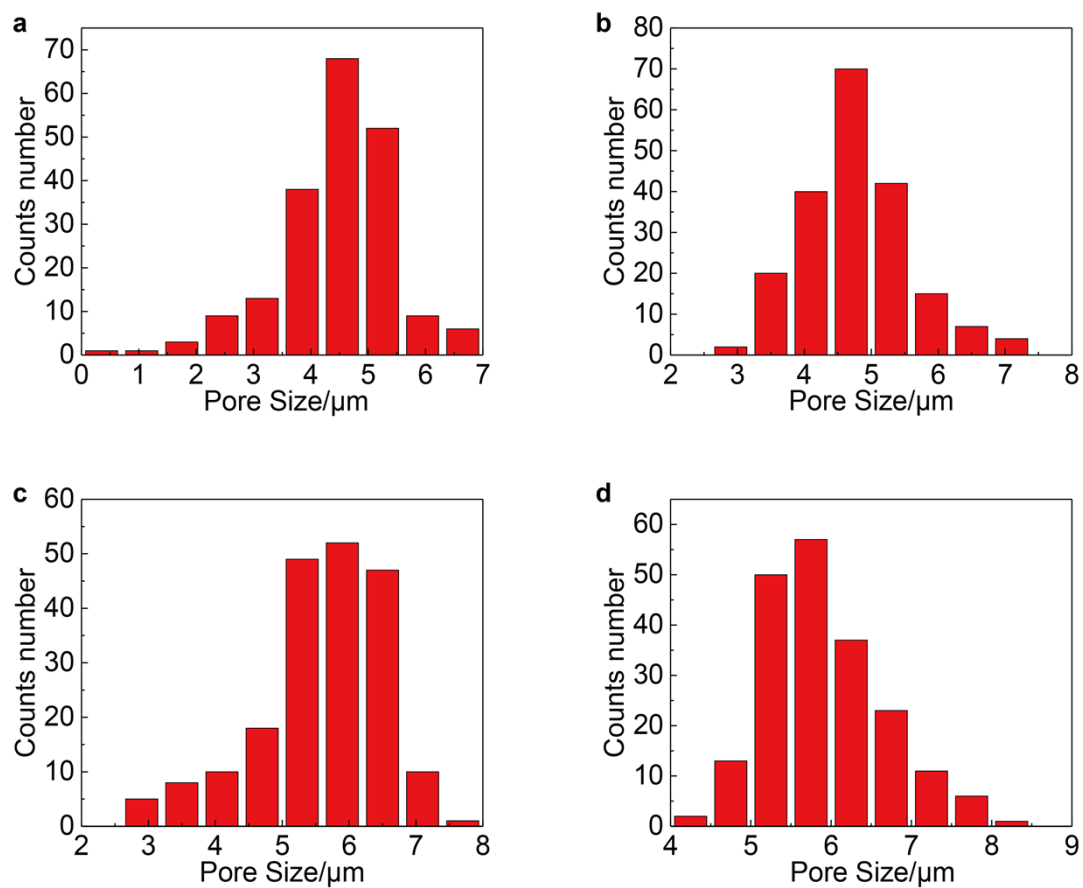


Fig. S2. Size distribution of PLM prepared with (a) 0.5 hrs, (b) 1.0 hr, (c) 2.0 hrs, and (d) 3.0 hrs UV irradiation. The other fabrication conditions are 5 mg/mL photoinitiator, and 72 hrs water treatment under room temperature.

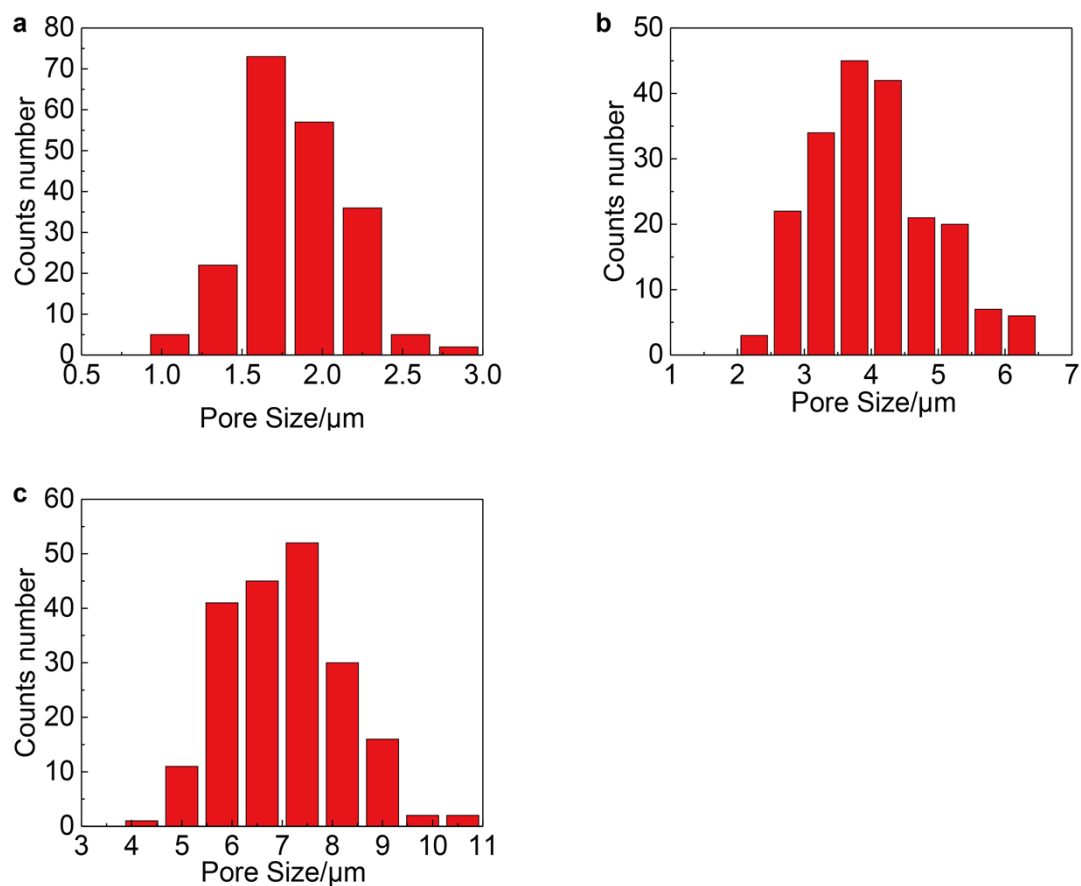


Fig. S3. Size distribution of PLM prepared with (a) 24 hrs, (b) 48 hrs, and (c) 96 hrs water treatment. The other fabrication conditions are 5 mg/mL photoinitiator, and 3 hrs UV irradiation under room temperature.

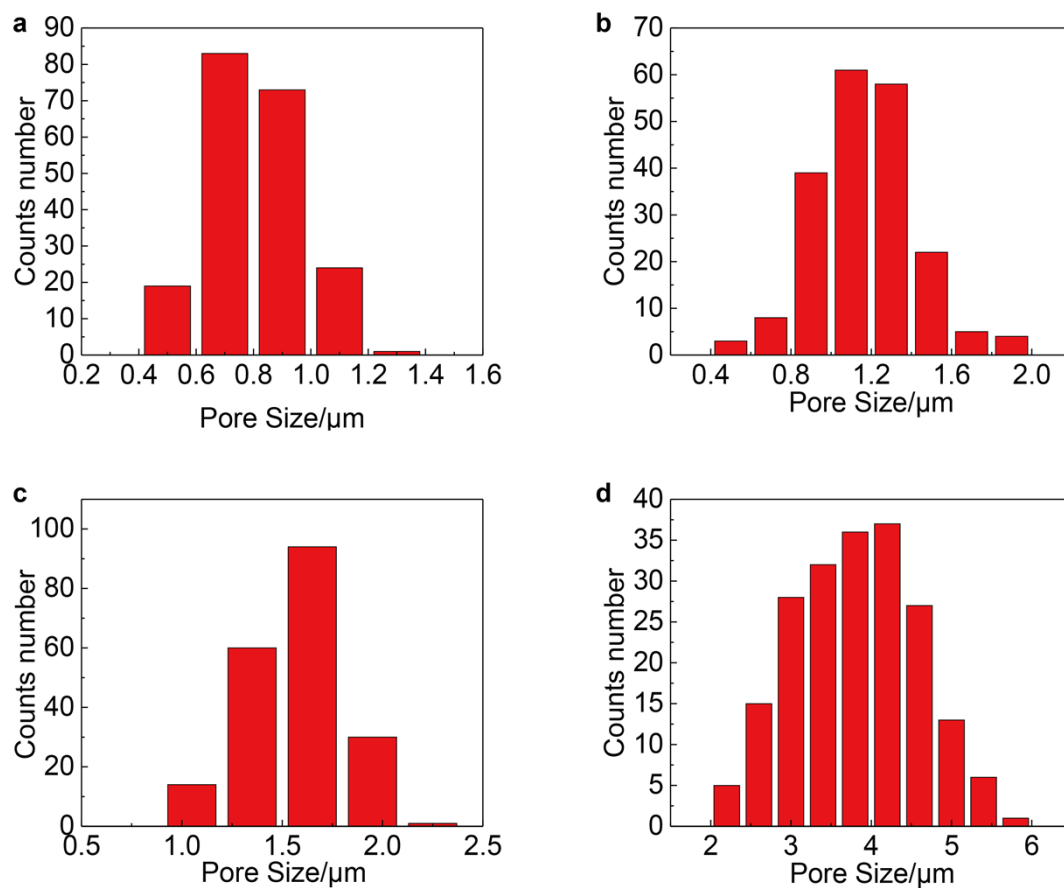


Fig. S4. Size distribution of PLM prepared with (a) 25°C, (b) 20°C, (c) 70°C, and (d) 90°C water treatment temperature. The other fabrication conditions are 5 mg/mL photoinitiator, 3 hrs UV irradiation, and 12 hrs water treatment.

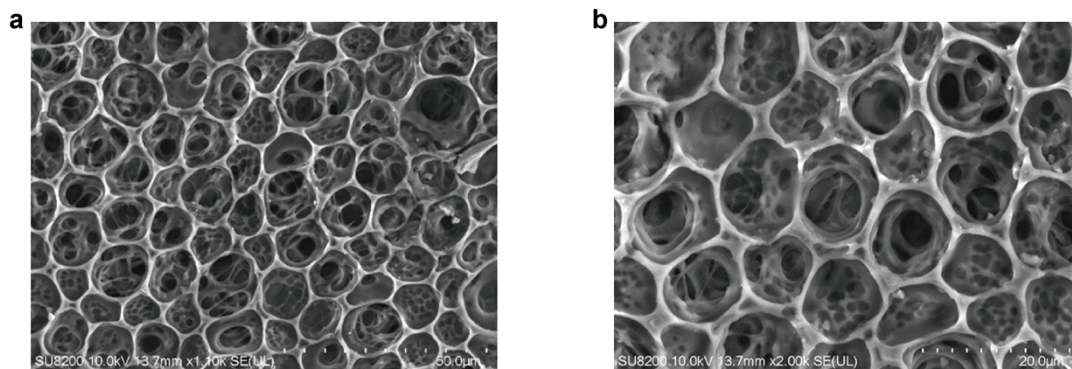


Fig. S5. SEM images of PLM after one week of water treatment.

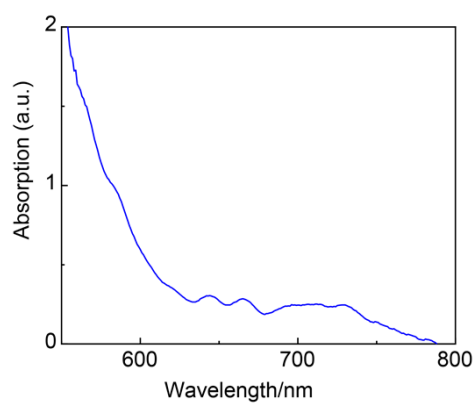


Fig. S6. UV-vis spectrum of in 1-(10-mercaptodecyl)-3-methylimidazolium ferric chloride bromide.

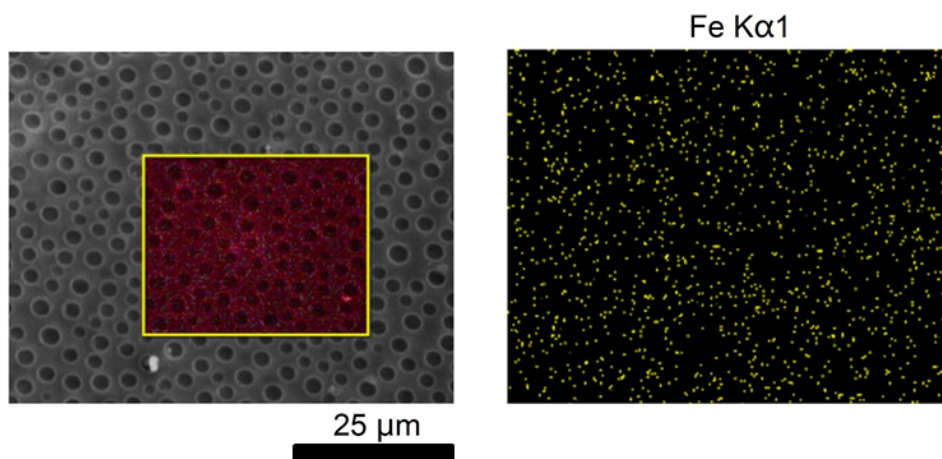


Fig. S7. EDS mapping of Fe element within mag-PLM prepared by using MIL 1-(10-mercaptodecyl)-3-methylimidazolium ferric chloride bromide.

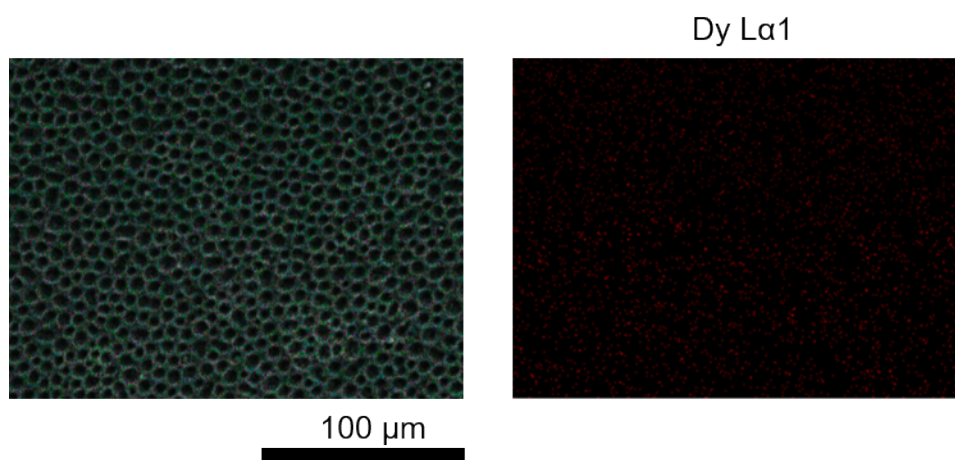


Fig. S8. EDS mapping of Dy element within mag-PLM prepared by using MIL 1-(10-mercaptodecyl)-3-methylimidazolium dysprosium chloride bromide.

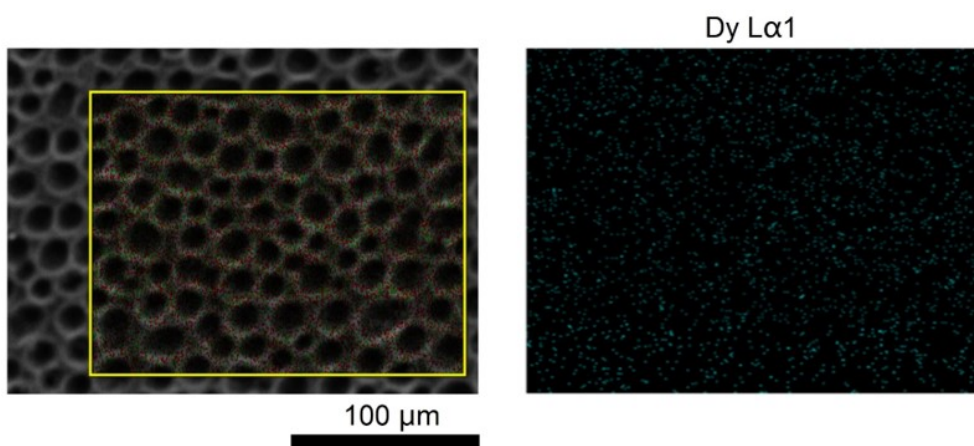


Fig. S9. EDS mapping of Dy element within mag-PLM prepared by using MIL 1-(10-mercaptopodecyl)-3-methylimidazolium dysprosium chloride bromide.

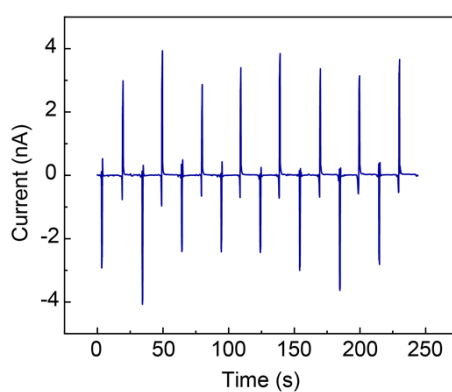


Fig. S10. Typical time-dependent short circuit current of a device fabricated by using mag-PLM synthesized with 24 hrs water treatment. The other fabrication conditions are 5 mg/mL photoinitiator, and 3 hrs UV irradiation under room temperature.

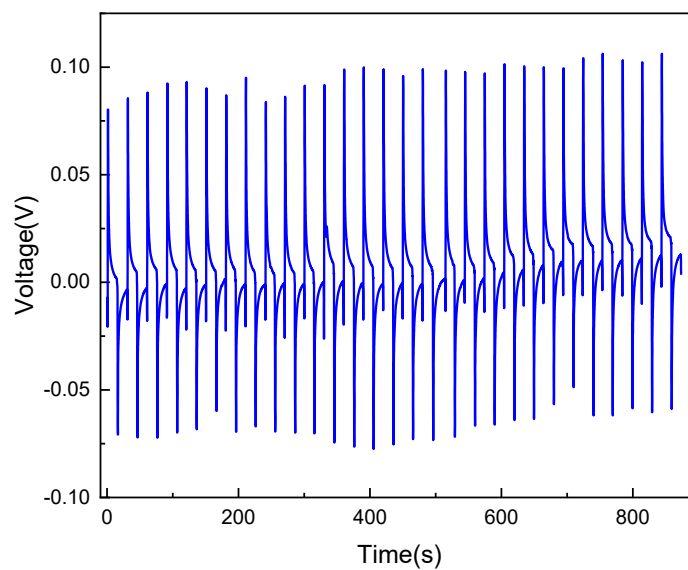


Fig. S11. Cycling (magnetic field on/off) performance of the magnetic energy harvesting device. The fabrication conditions are 5 mg/mL photoinitiator, 3 hrs UV irradiation, and 64 hrs water treatment under room temperature.

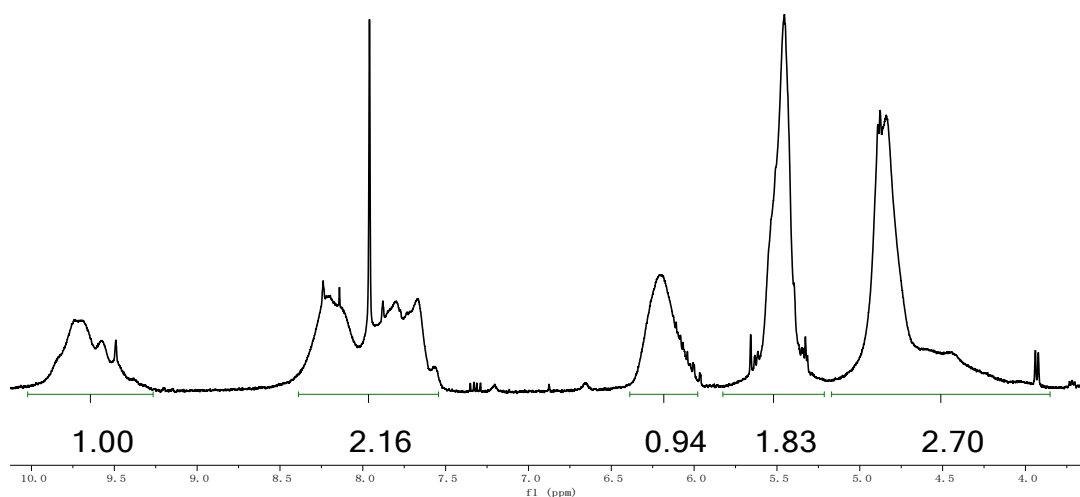


Fig. S12. NMR spectrum of poly(3-allylmethyl-1-vinylimidazole) bromide.

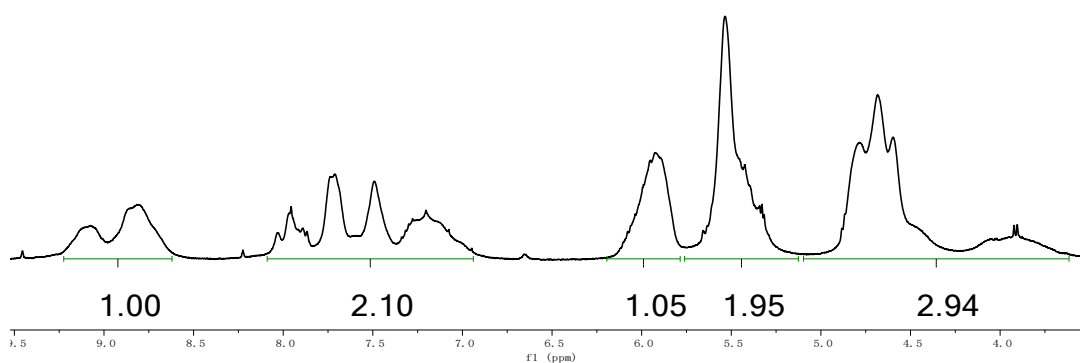


Fig. S13. NMR spectrum of poly(3-allylmethyl-1-vinylimidazole) bis(trifluoromethanesulfonyl)imide.

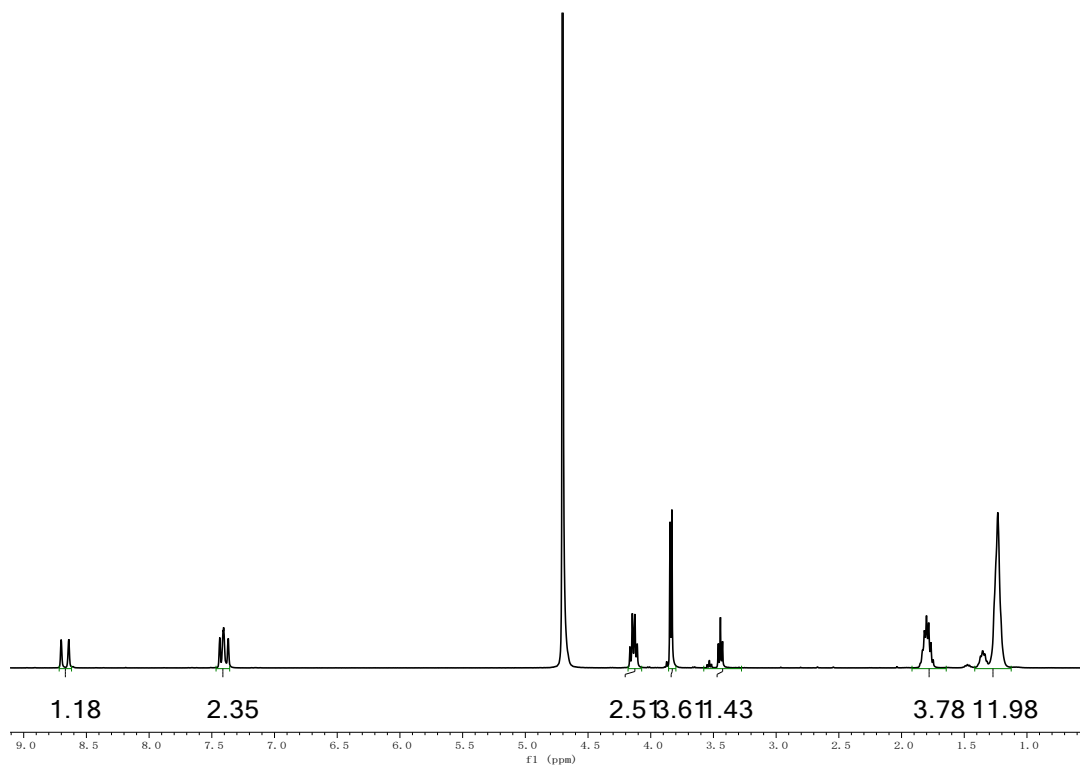


Fig. S14. NMR spectrum of 1-(10-Bromodecyl)-3- Methylimidazole.

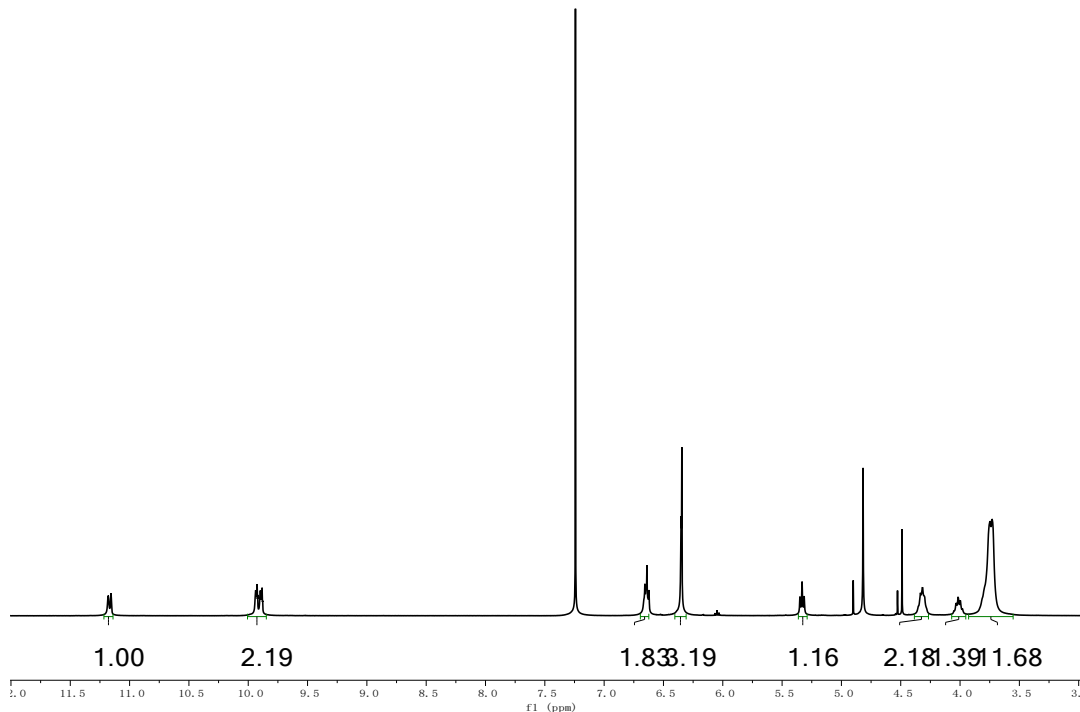


Fig. S15. NMR spectrum of 1-(10-thioethyl decyl)-3-methylimidazole bromide.

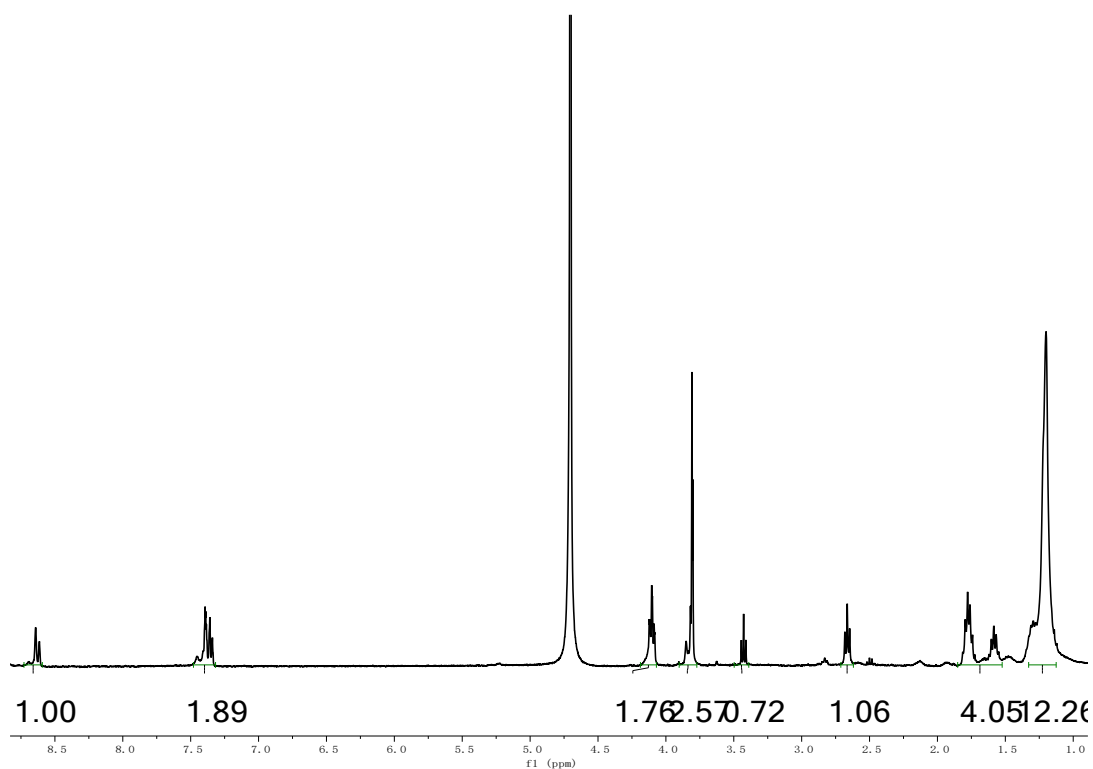


Fig. S16. NMR spectrum of 1-(10-mercaptodecyl)-3-methylimidazole bromide.

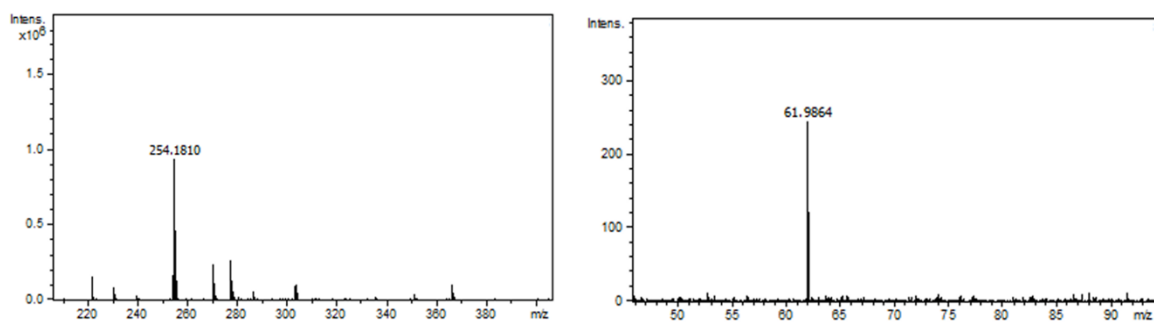


Fig. S17. Electrospray ionization mass spectrometry of 1-(10-mercaptodecyl)-3-methylimidazole nitrate.

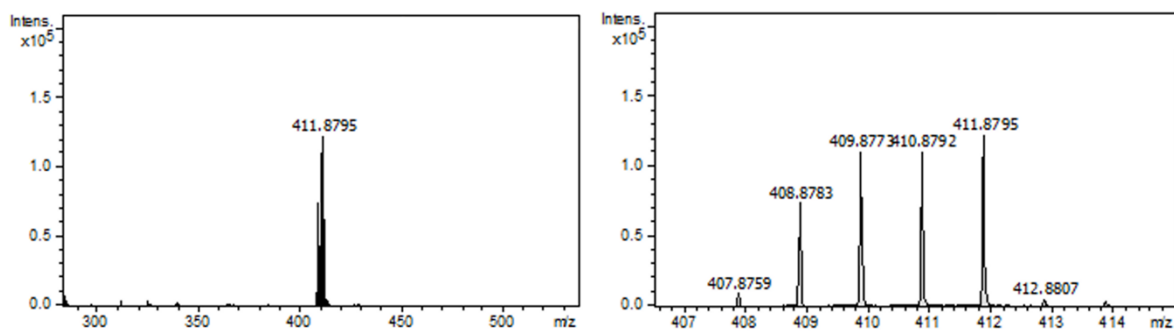


Fig. S18. Electrospray ionization mass spectrometry of 1-(10-mercaptodecyl)-3-methylimidazolium dysprosium tetranitrate.

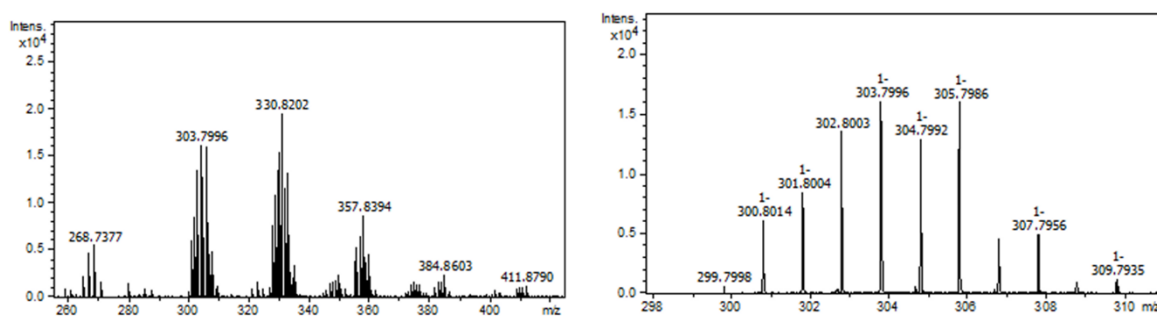


Fig. S19. Electrospray ionization mass spectrometry of 1-(10-mercaptodecyl)-3-methylimidazolium dysprosium chloride bromide.