

Supporting Information

Zwitterionic Dipicolinic Acid-Based Tracers for Reservoir Surveillance Application

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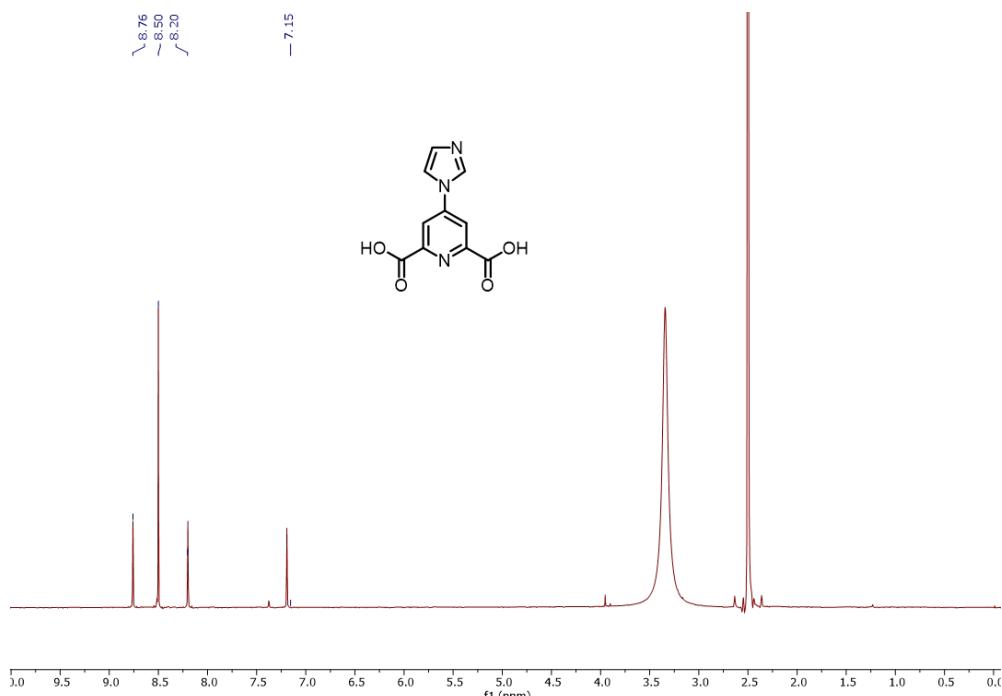


Figure S1. ¹H NMR spectrum of IM-DPA.

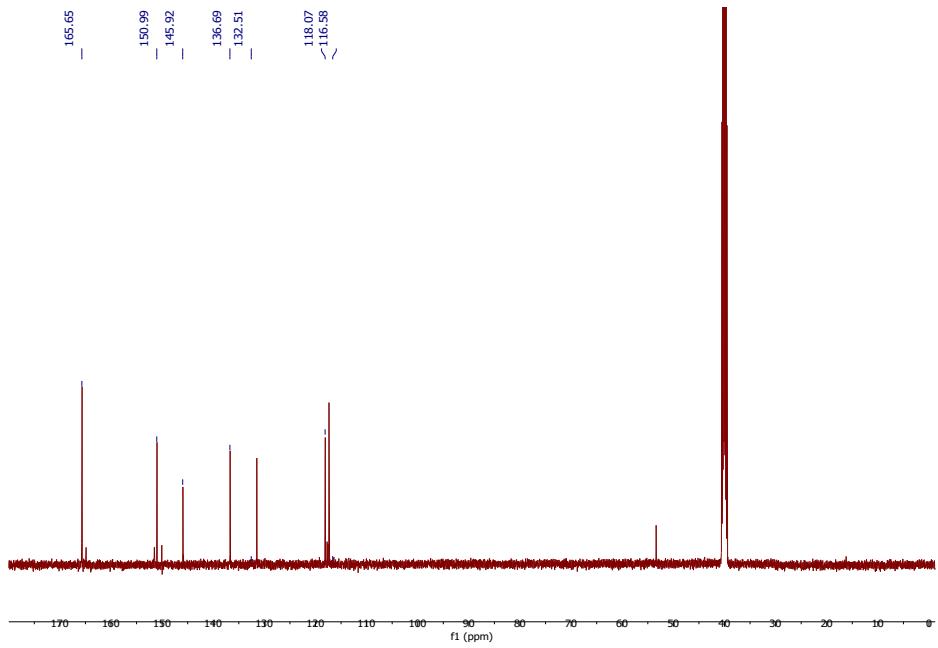


Figure S2. ¹³C NMR spectrum of IM-DPA.

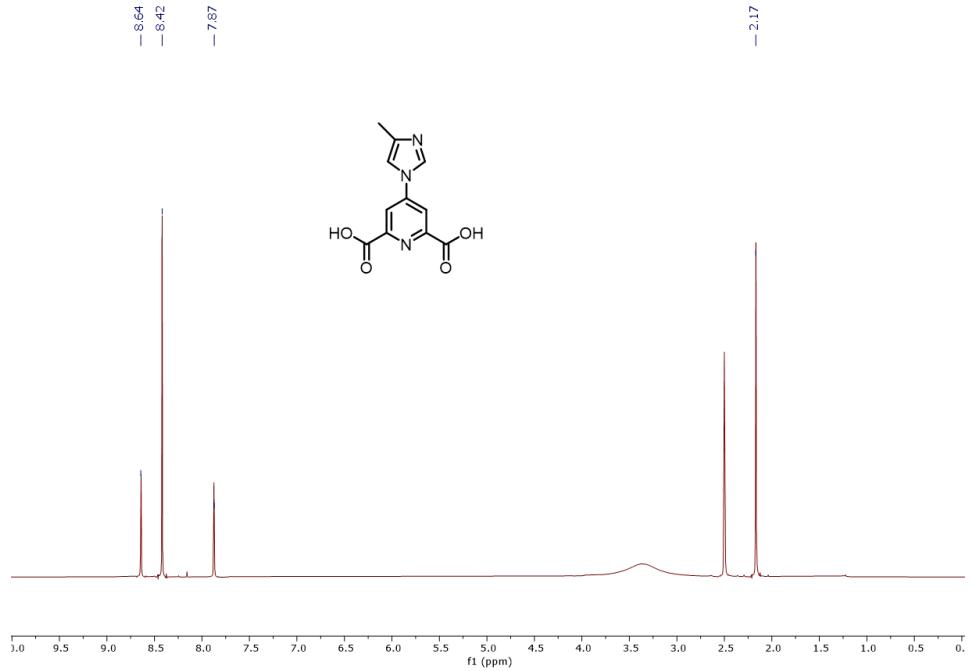


Figure S3. ^1H NMR spectrum of MIM-DPA.

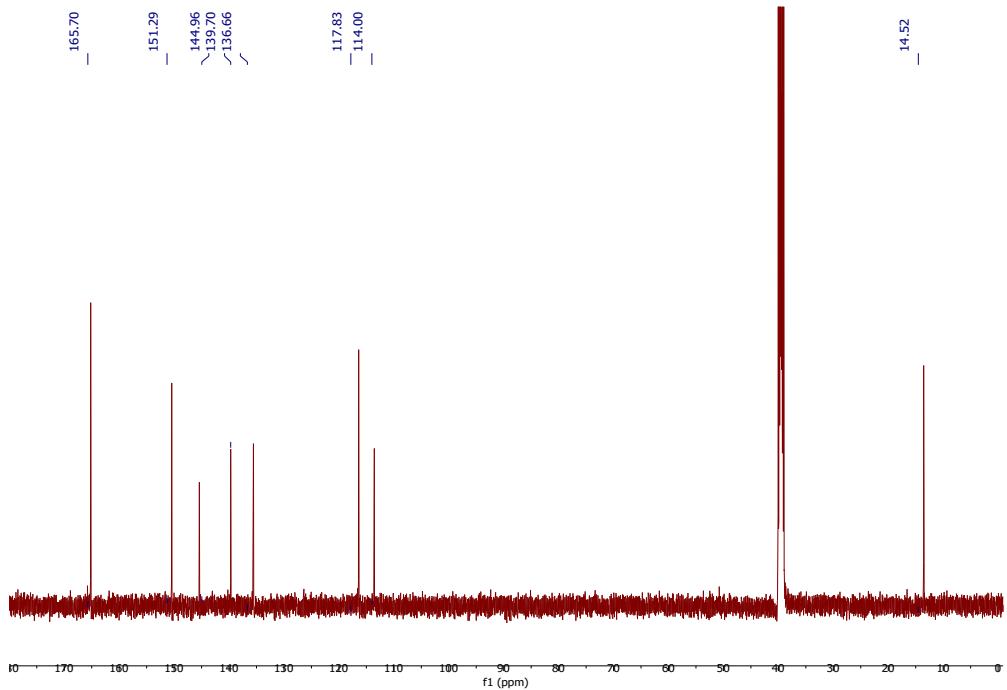


Figure S4. ^{13}C NMR spectrum of MIM-DPA.

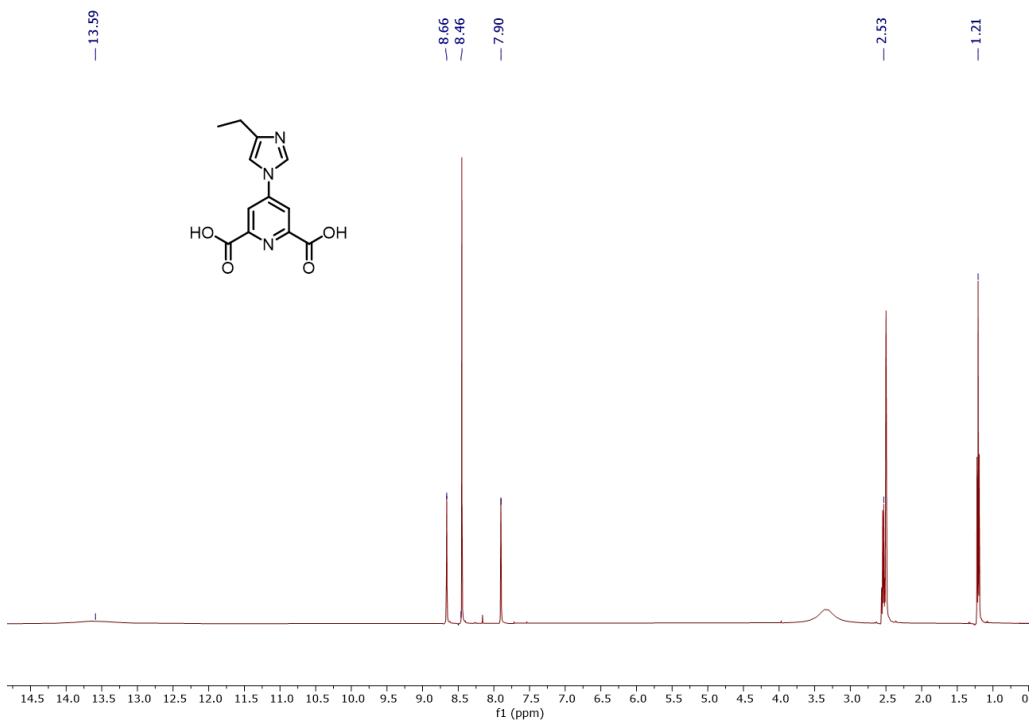


Figure S5. ¹H NMR spectrum of EIM-DPA.

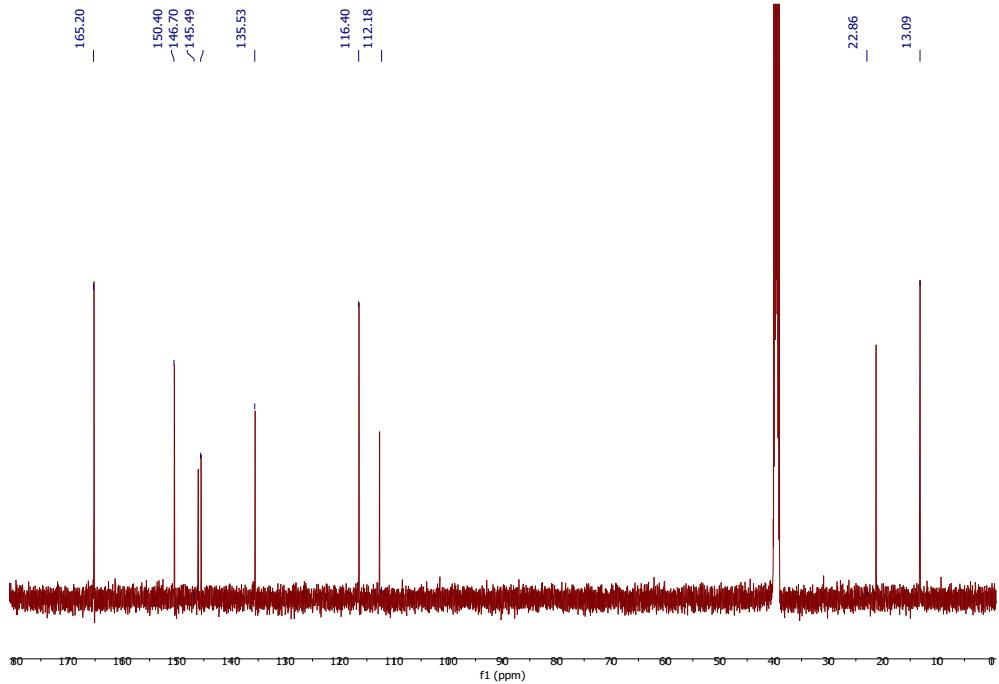


Figure S6. ¹³C NMR spectrum of EIM-DPA.

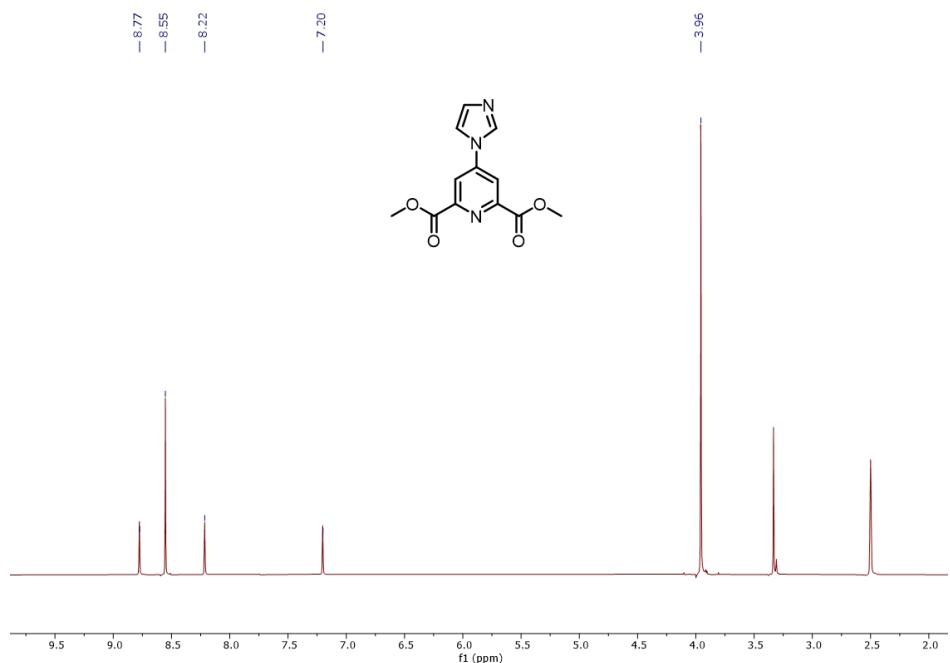


Figure S7. ^1H NMR spectrum of IM-PDC.

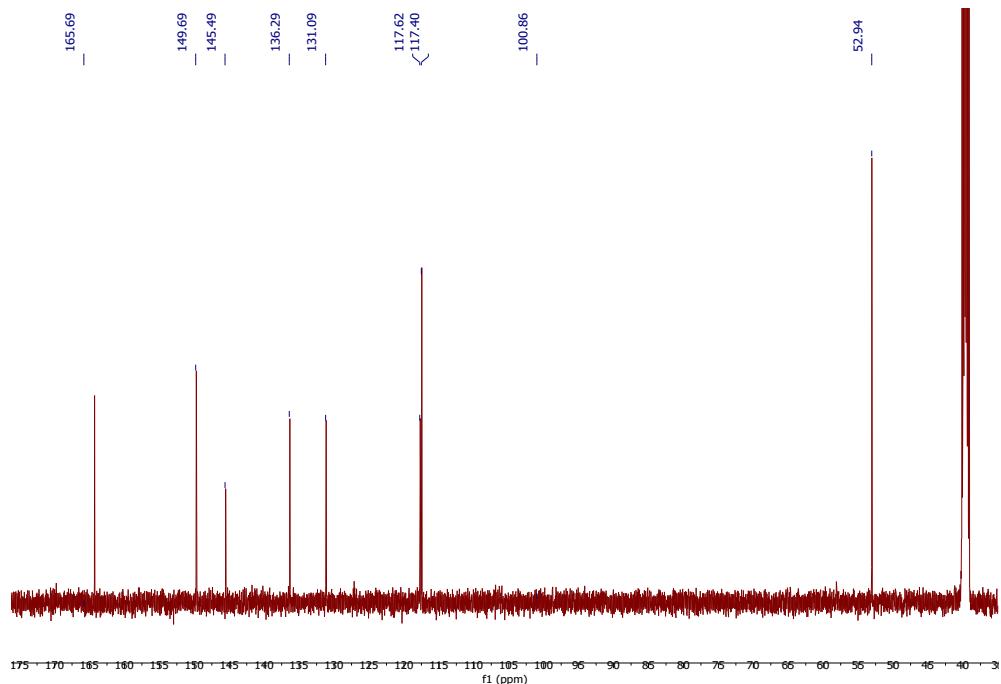


Figure S8. ^{13}C NMR spectrum of IM-PDC.

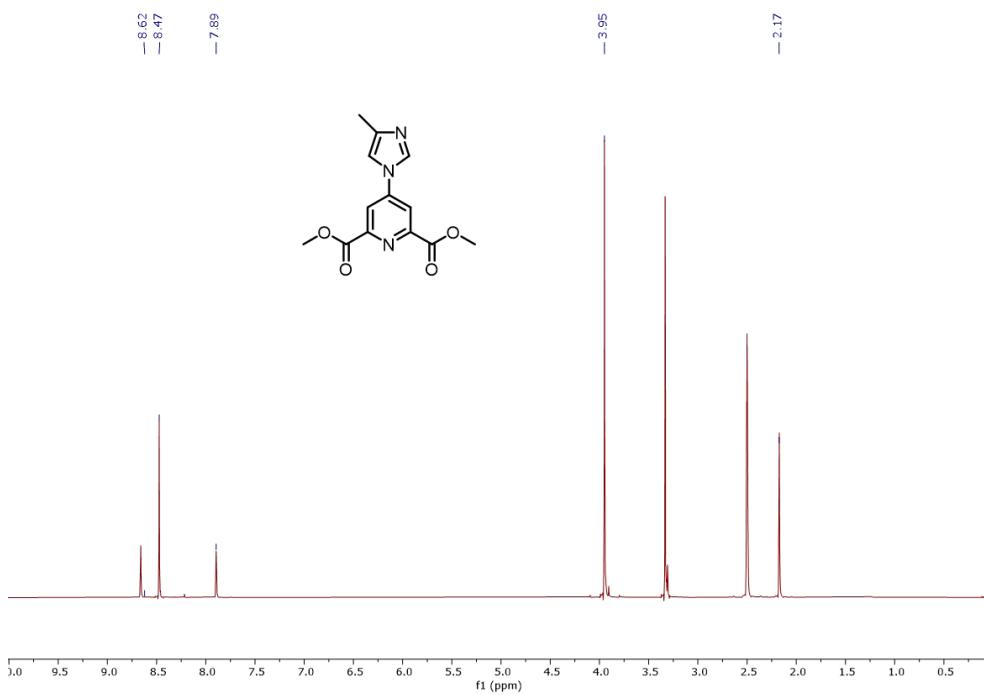


Figure S9. ¹H NMR spectrum of MIM-PDC.

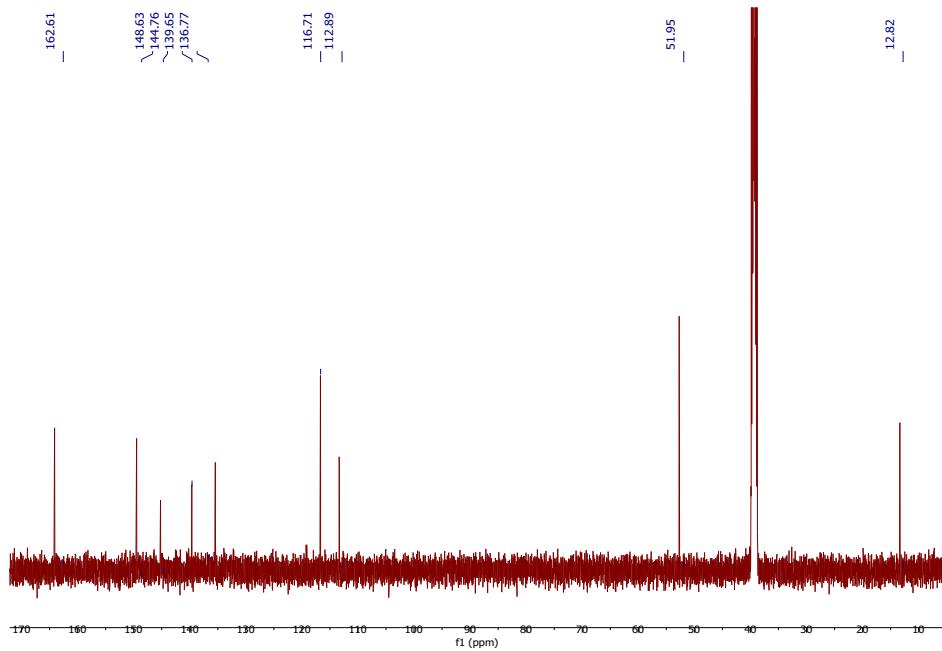


Figure S10. ¹³C NMR spectrum of MIM-PDC.

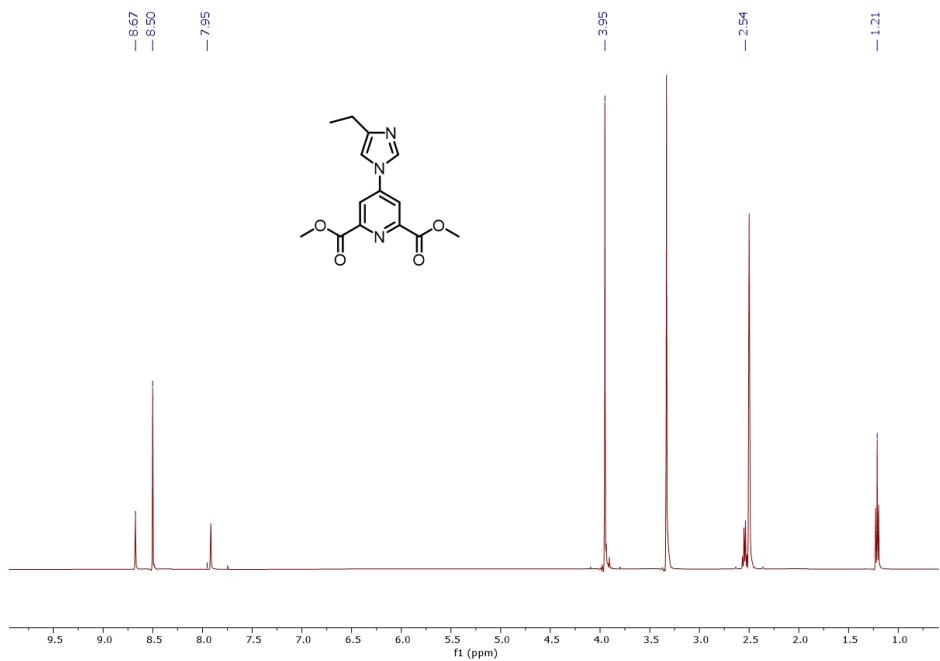


Figure S11. ¹H NMR spectrum of EIM-PDC.

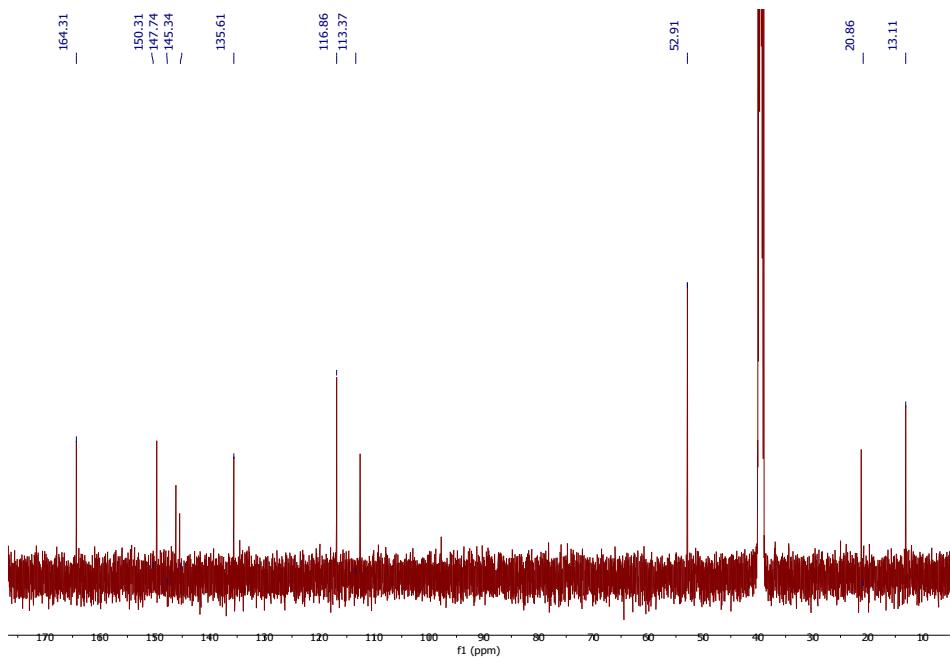


Figure S12. ^{13}C NMR spectrum of EIM-PDC.

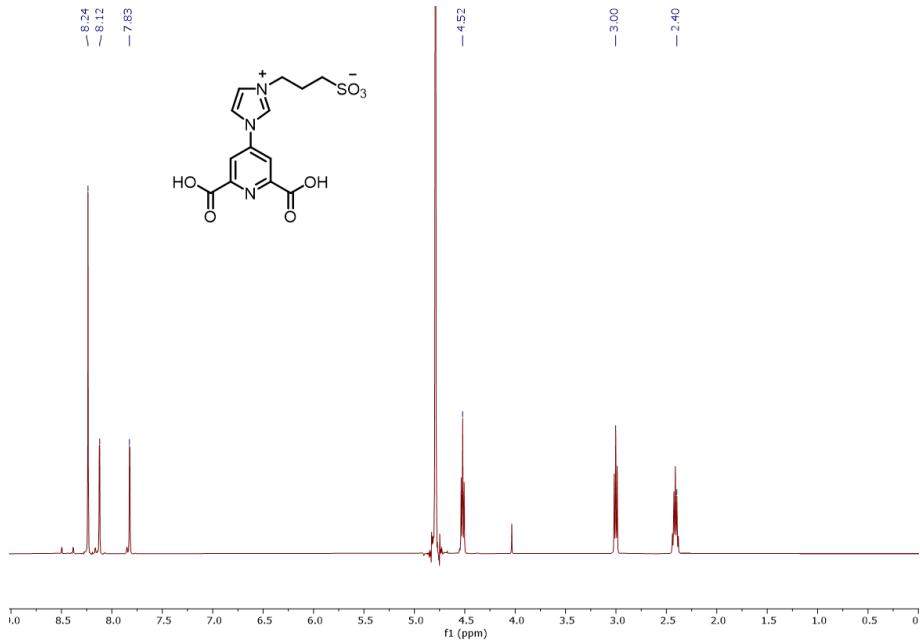


Figure S13. ^1H NMR spectrum of S-IM-DPA.

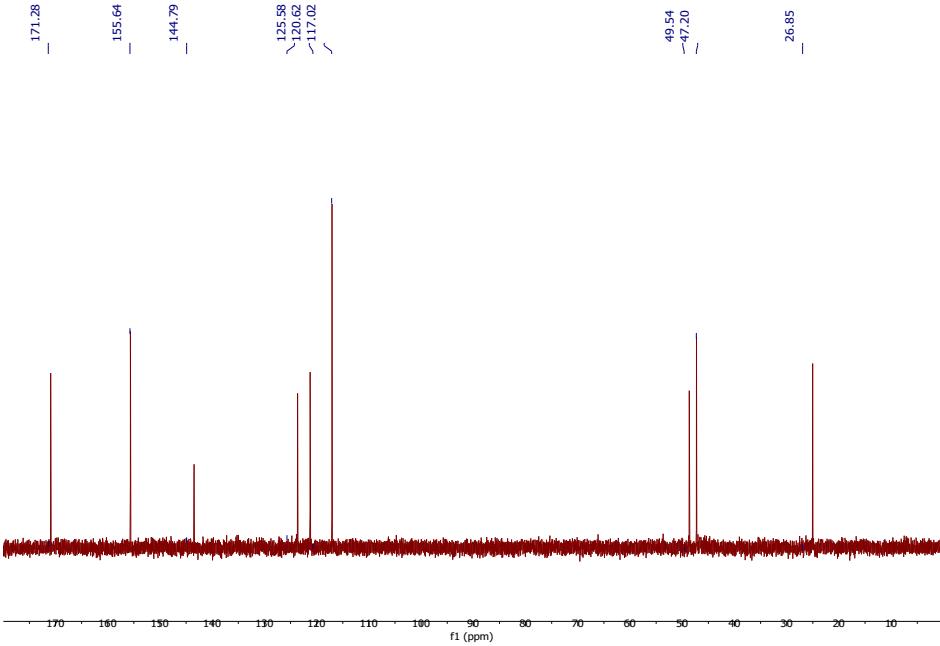


Figure S14. ^{13}C NMR spectrum of S-IM-DPA.

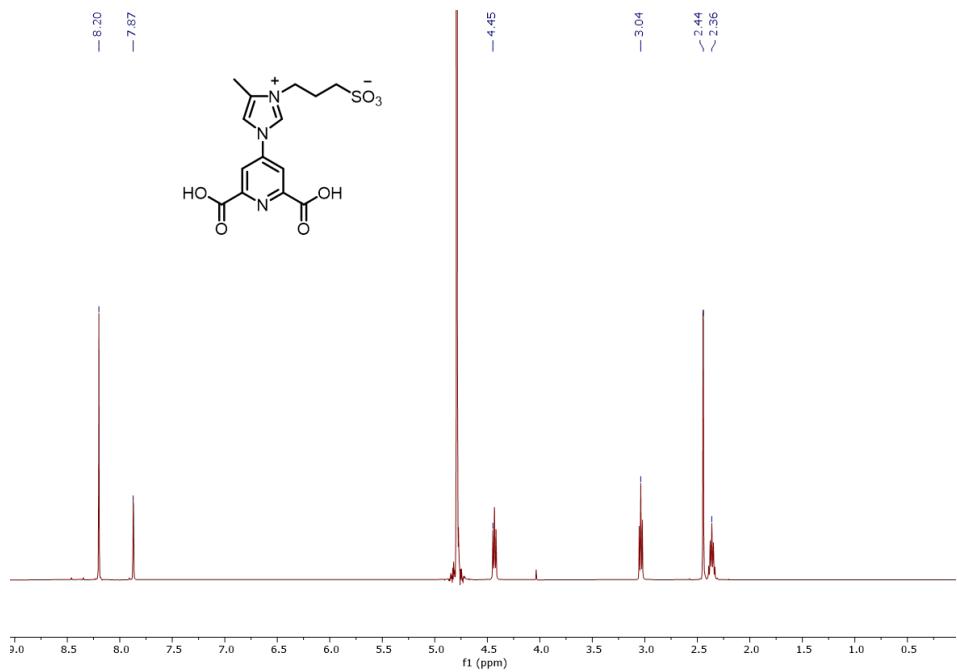


Figure S15. ¹H NMR spectrum of S-MIM-DPA.

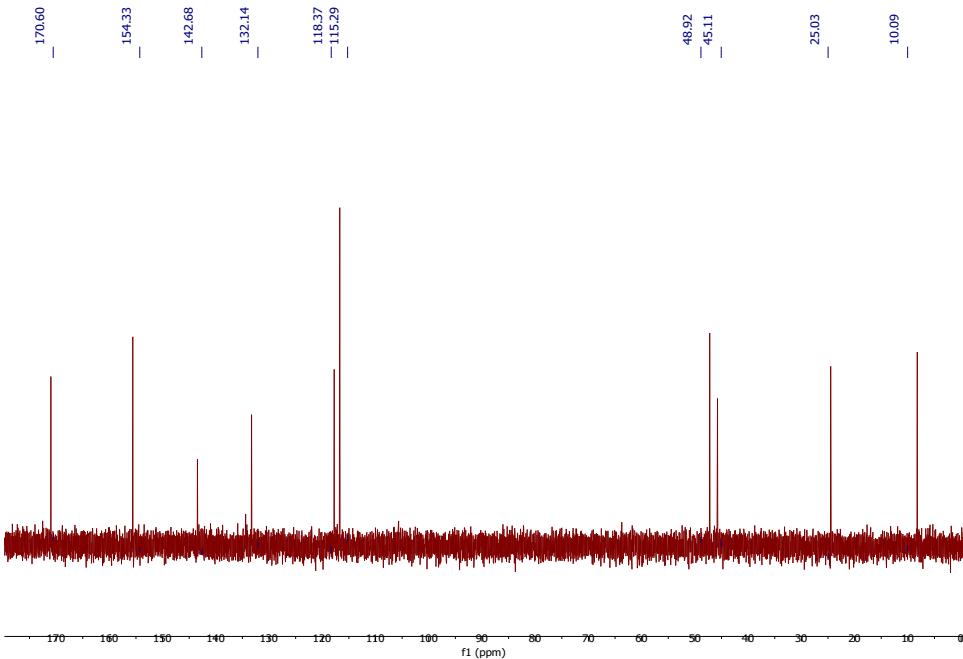


Figure S16. ¹³C NMR spectrum of S-MIM-DPA.

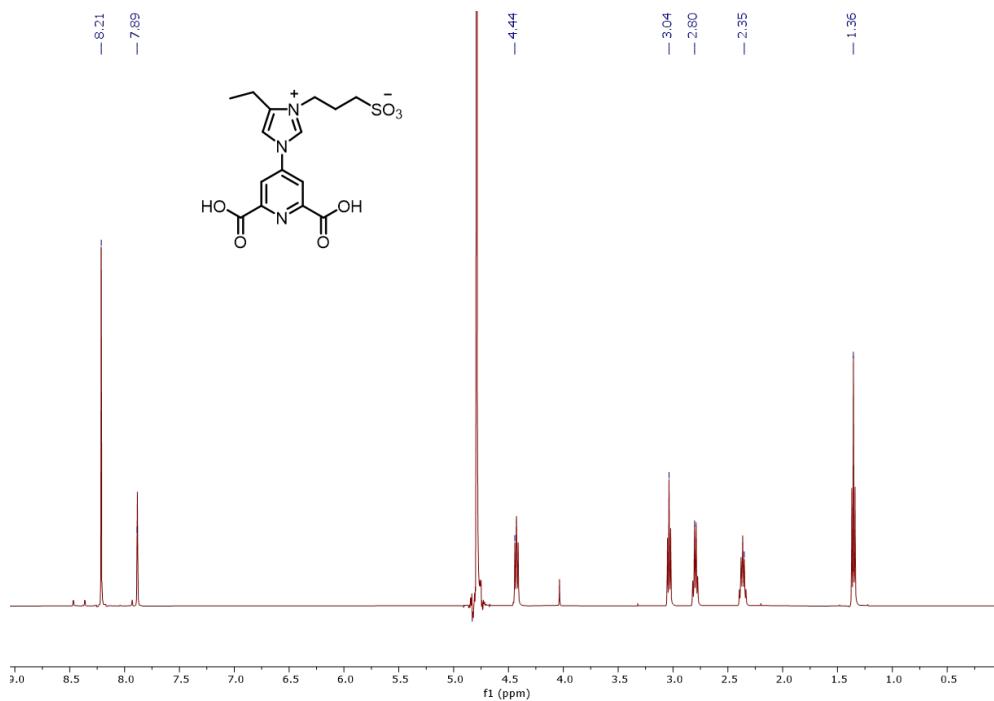


Figure S17. ¹H NMR spectrum of S-EIM-DPA.

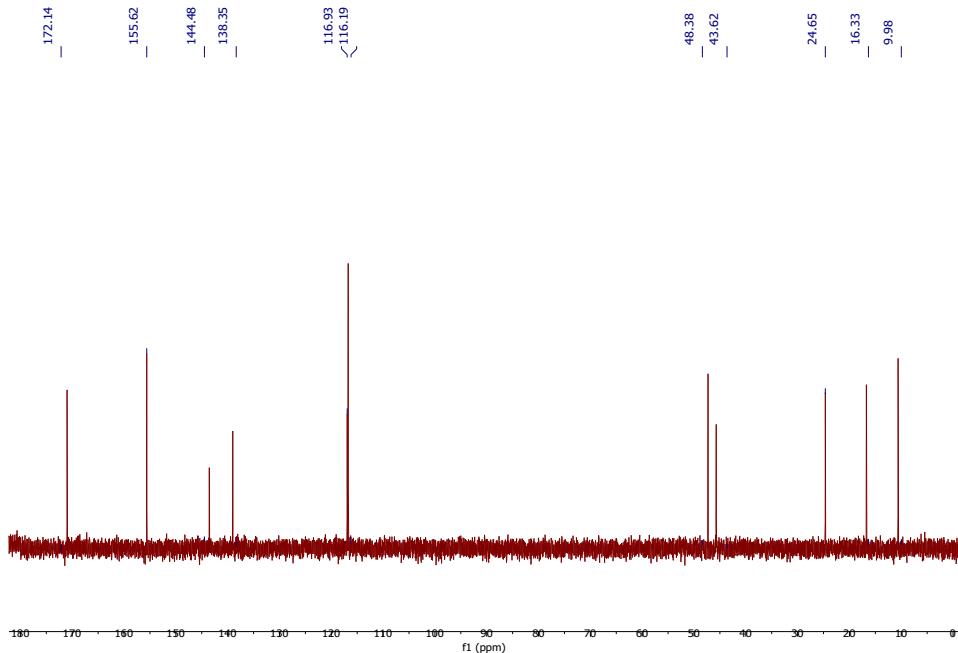


Figure S18. ¹³C NMR spectrum of S-EIM-DPA.

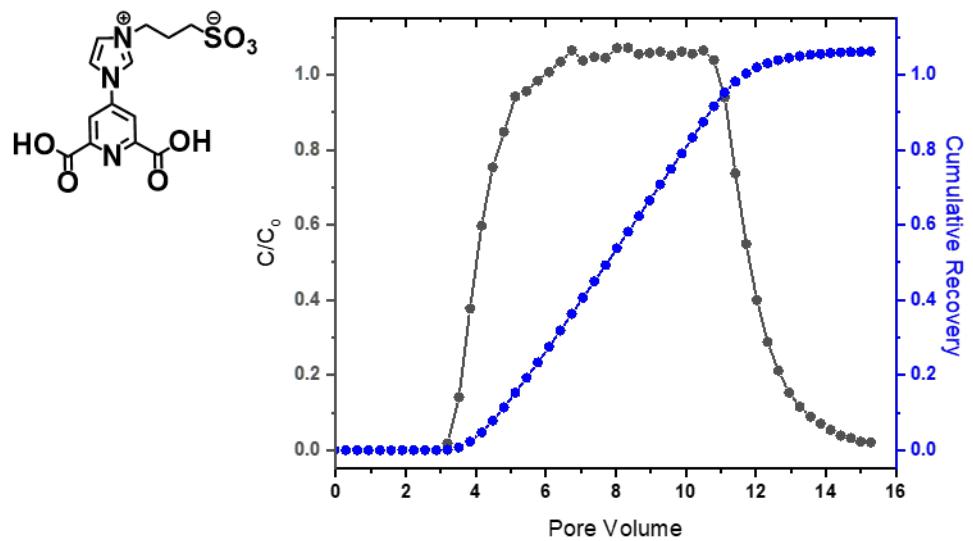
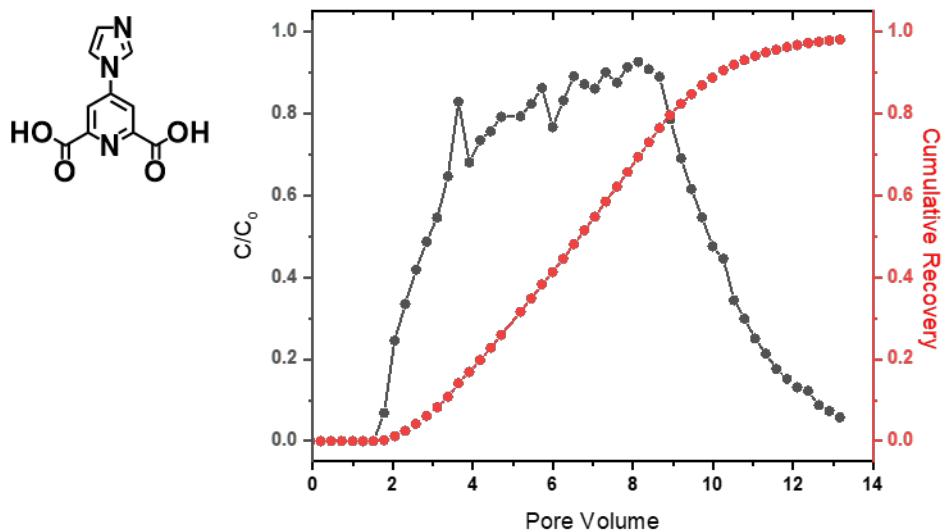


Figure S19. Top: Coreflood breakthrough and cumulative recovery curves of IM-DPA. Bottom: Coreflood breakthrough and cumulative recovery curves of S-IM-DPA. Note: where cumulative recovery is > 1.0 is due to experimental error.

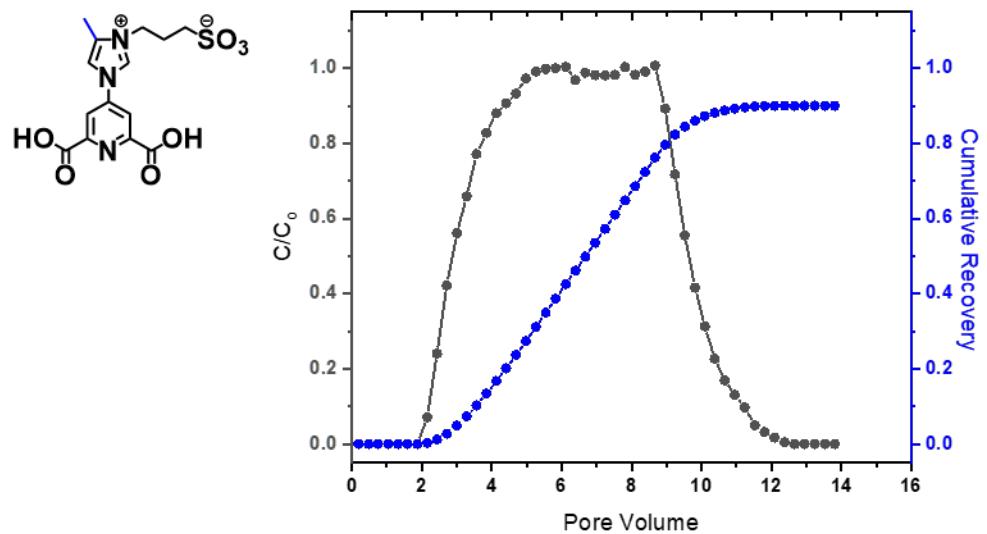
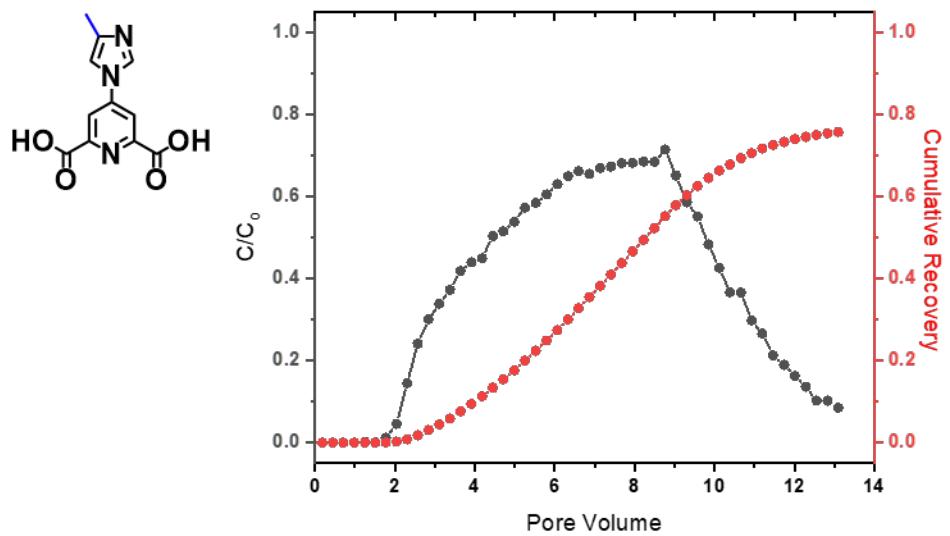


Figure S20. Top: Coreflood breakthrough and cumulative recovery curves of MIM-DPA. Bottom: Coreflood breakthrough and cumulative recovery curves of S-MIM-DPA.

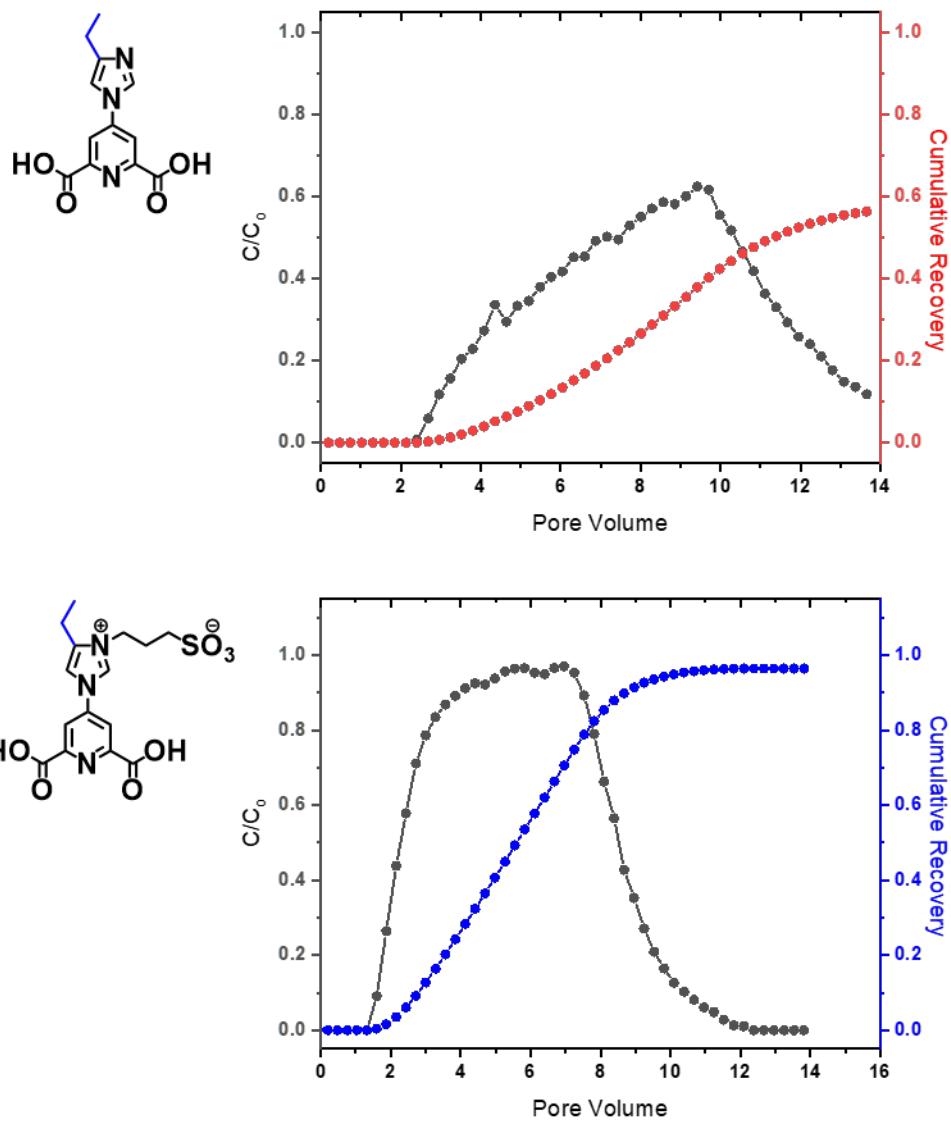


Figure S21. Top: Coreflood breakthrough and cumulative recovery curves of EIM-DPA.
Bottom: Coreflood breakthrough and cumulative recovery curves of S-EIM-DPA.

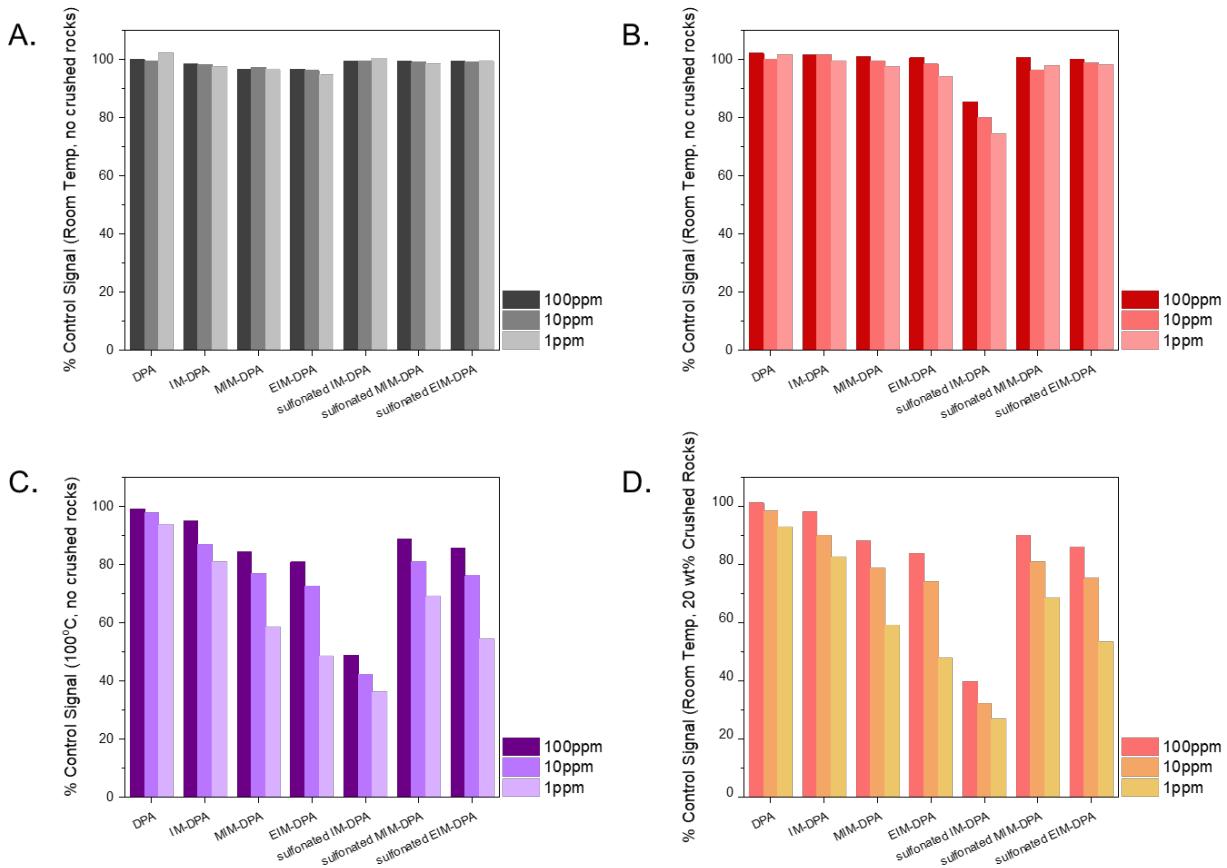


Figure S22. A) DPA-based tracers concentrations present in samples of seawater with 20 wt% crushed carbonate rocks after 14 days at room temperature with respect to room temperature reference without rocks. B) DPA-based tracers concentrations present in samples of seawater without rocks after 14 days 100 °C with respect to room temperature reference without rocks. C) DPA-based tracers concentrations present in samples of seawater with 20 wt% crushed carbonate rocks after 14 days at 100 °C with respect to 100 °C reference without rocks. D.) DPA-based tracers concentrations present in samples of seawater with 20 wt% crushed carbonate rocks after 14 days at 100 °C with respect to room temperature reference with 20 wt% crushed carbonate rocks.