

Supporting information

Rational Design of BIAN Based Multi-functional Additive for Higher Durability and Performance of $\text{LiMn}_{1/3}\text{Ni}_{1/3}\text{Co}_{1/3}\text{O}_2$ Cathodes

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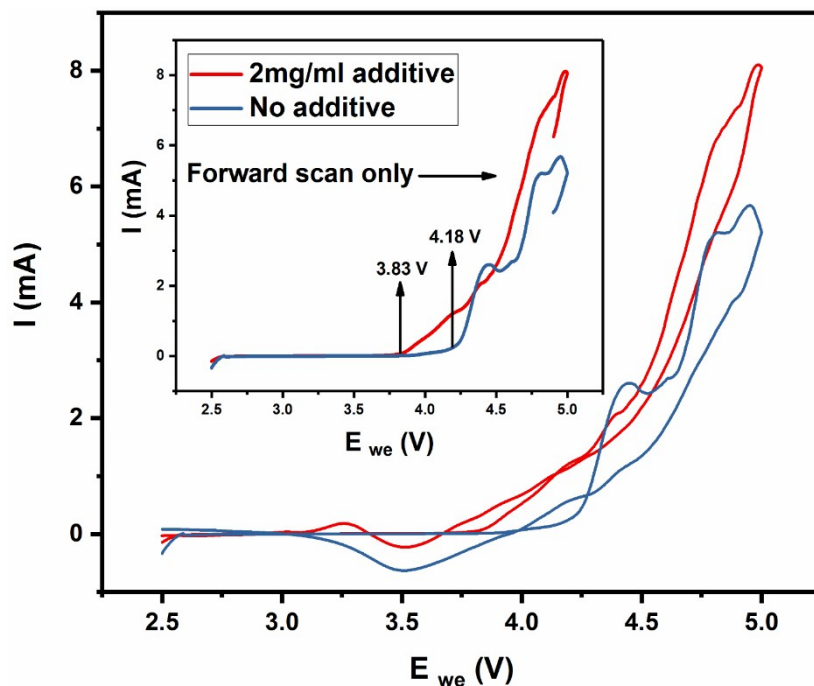


Figure S1. Comparison of first CV cycle with and without BIANODA as additive in cathodic half-cell set up (MNC cathode in 1M LiPF₆ in EC:DEC W.r.t Li)

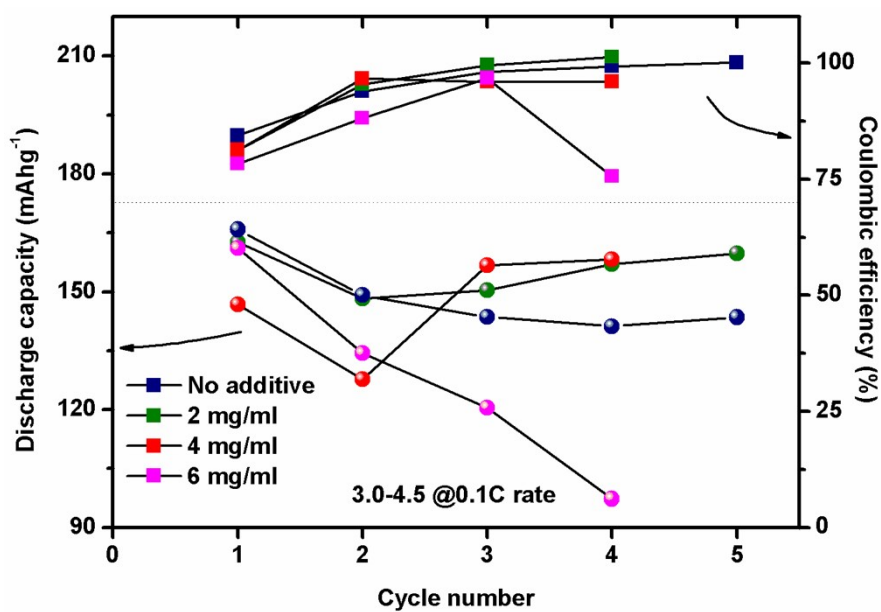


Figure S2. Evolution of discharge capacity upon varying concentration of BIANODA (at 0.1C rate)

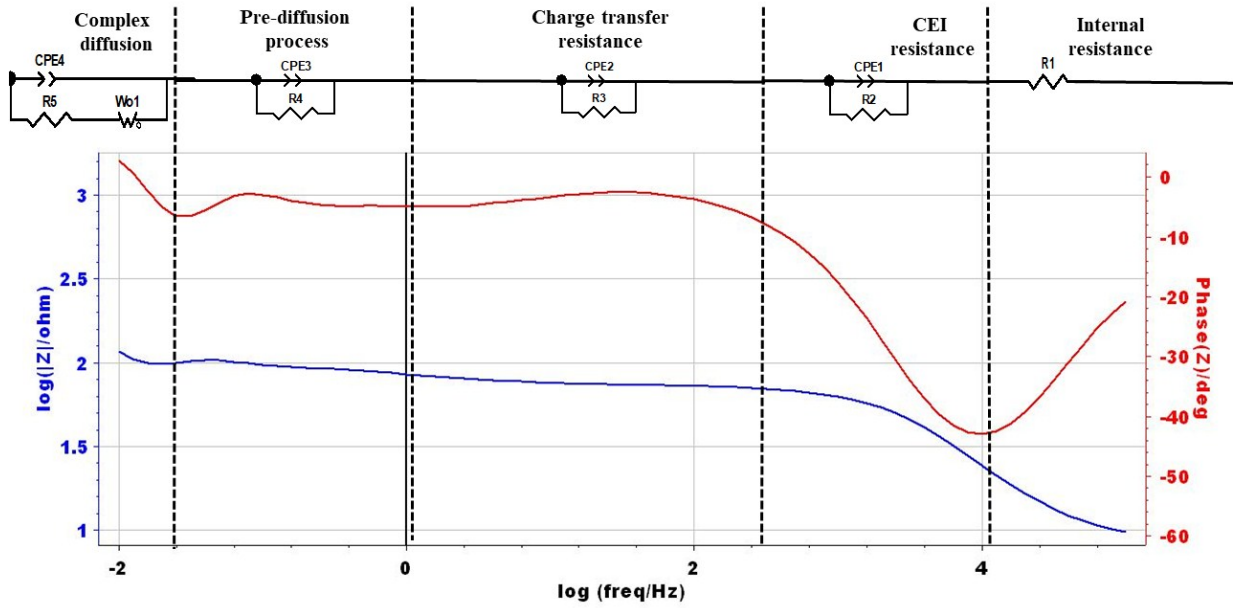


Figure S3. Bode impedance plot of cell without additive (from Dynamic EIS during discharge at potential 3.6V)

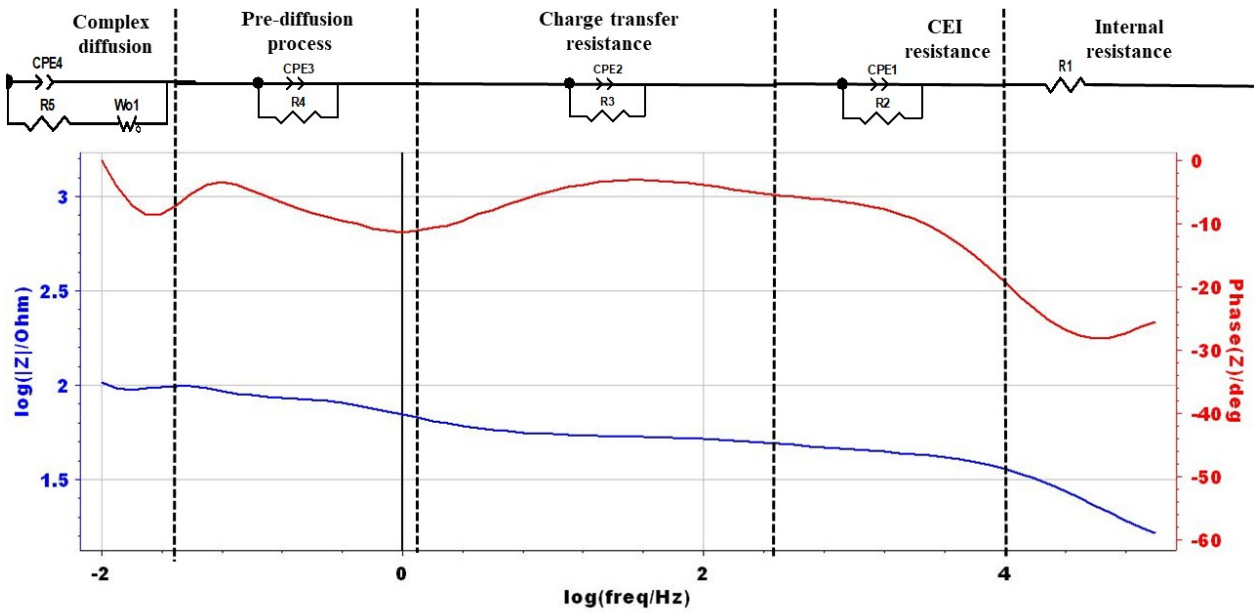


Figure S4. Bode impedance plot of cell with 2mg/ml BIANODA (from Dynamic EIS during discharge at potential 3.6V)

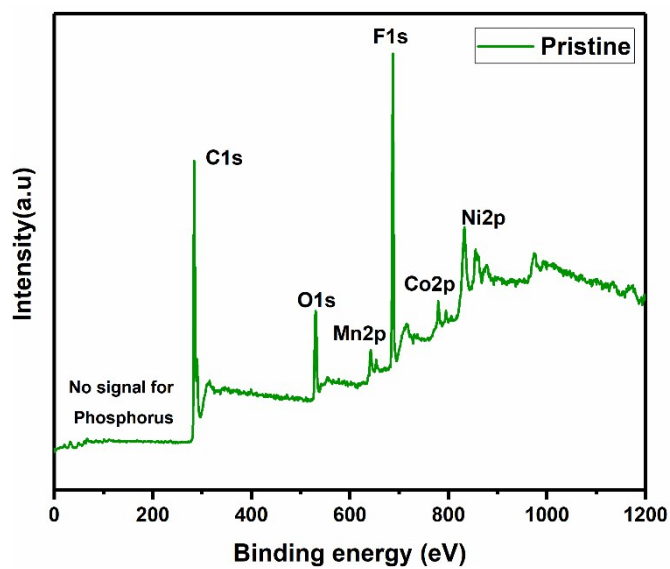


Figure S5. A. XPS of pristine electrode surface

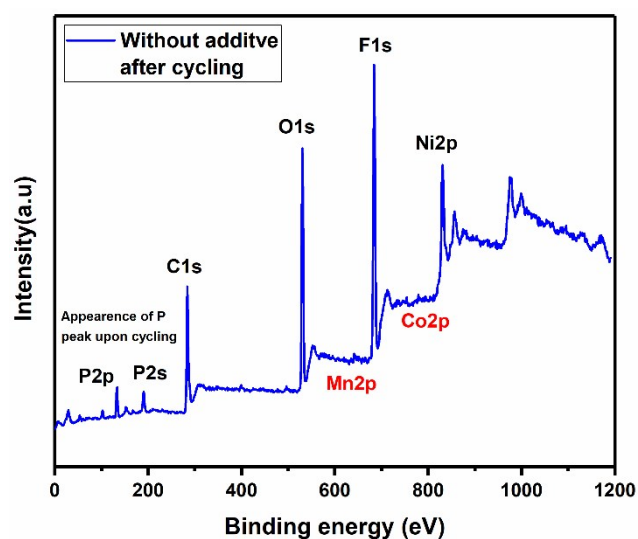


Figure S5. B. XPS of electrode surface after cycling without additive

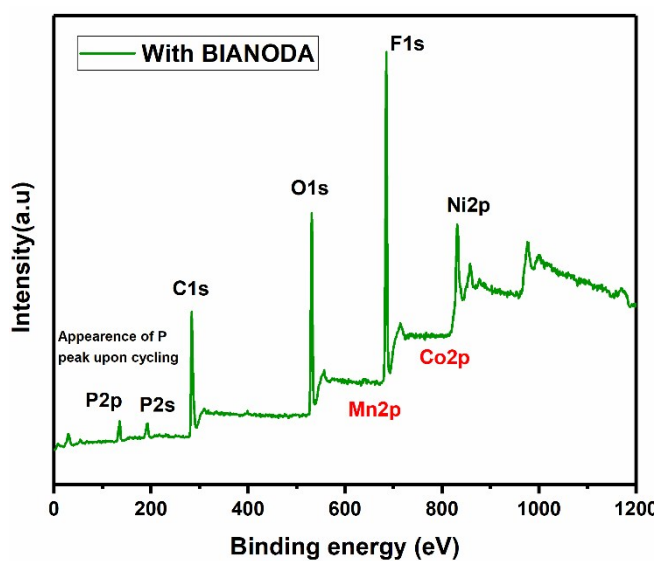


Figure S5. C. XPS of electrode surface after cycling with BIANODA

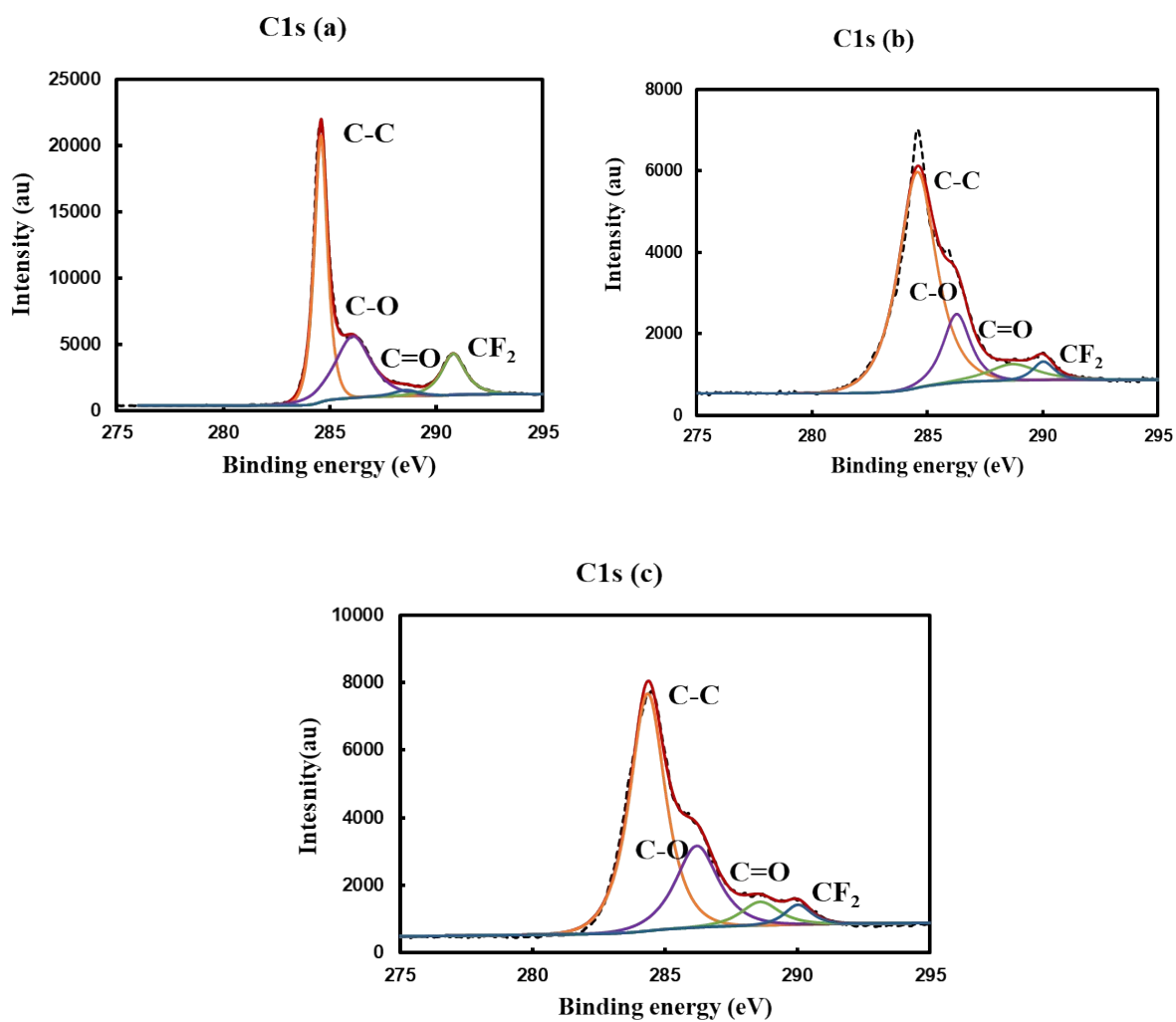


Figure S6. XPS spectra for C 1s of (a) pristine cathode, (b) cathode surface after cycling without additive and (c) cathode surface after cycling with additive

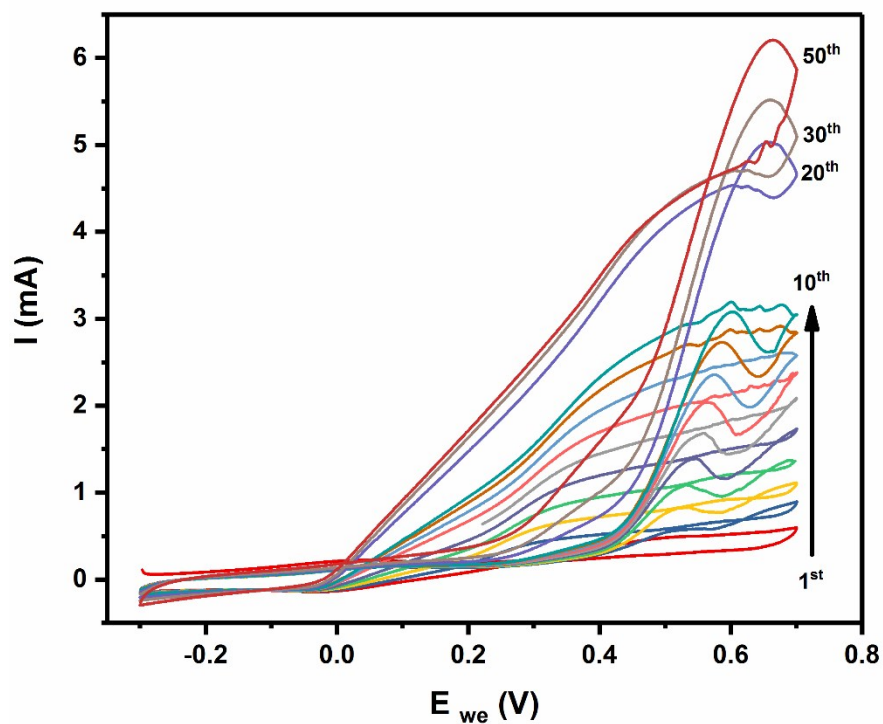


Figure S7. Cyclic voltammograms during electropolymerisation of BIANODA in 0.1M LiClO_4 acetonitrile solution (WE: Pt disc, RE: Ag/AgCN, CE: Pt wire)

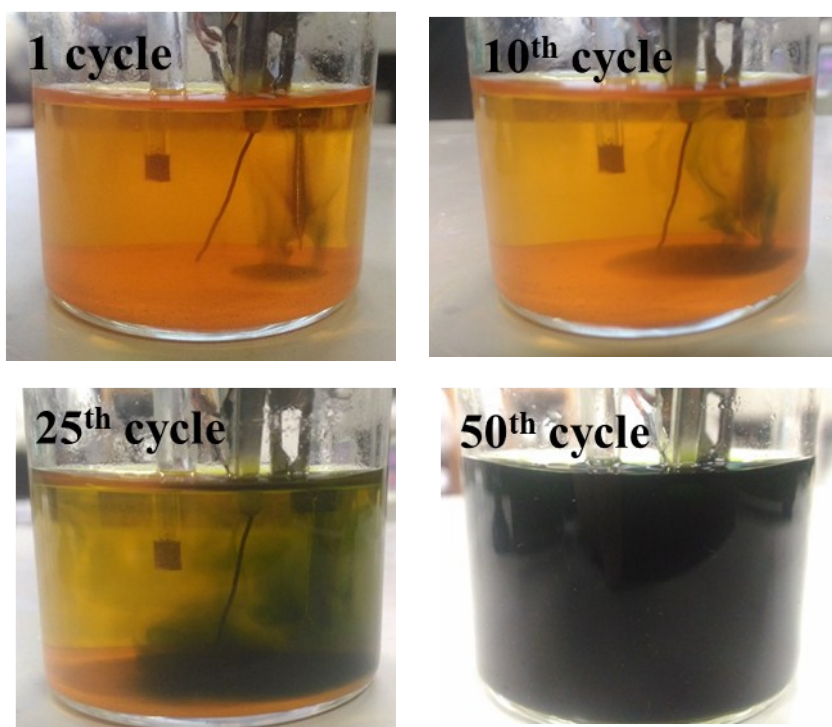


Figure S8. Digital images during different number of CV cycles of electropolymerisation

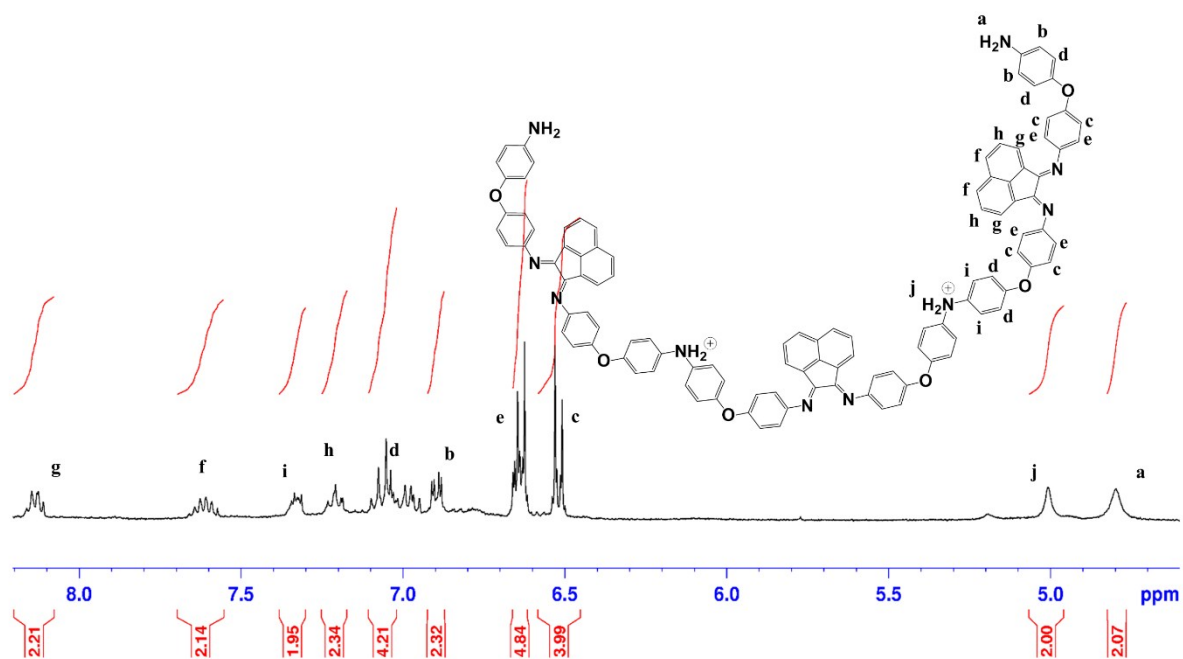


Figure S9. ¹H NMR of the electropolymerised product in DMSO-d₆

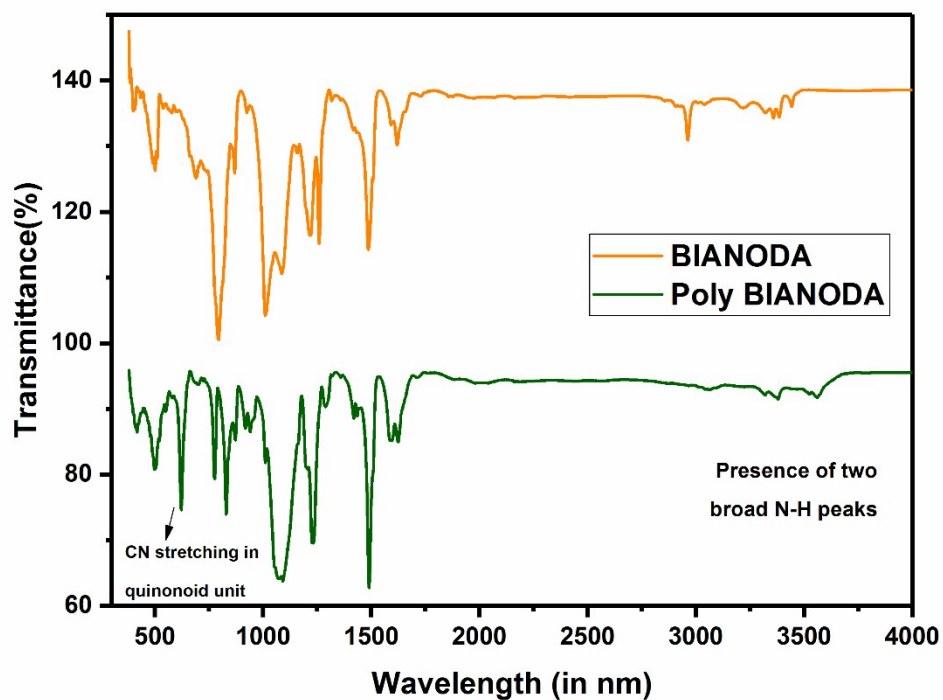


Figure S10. Comparison of IR spectra of BIANODA and the electropolymerised product

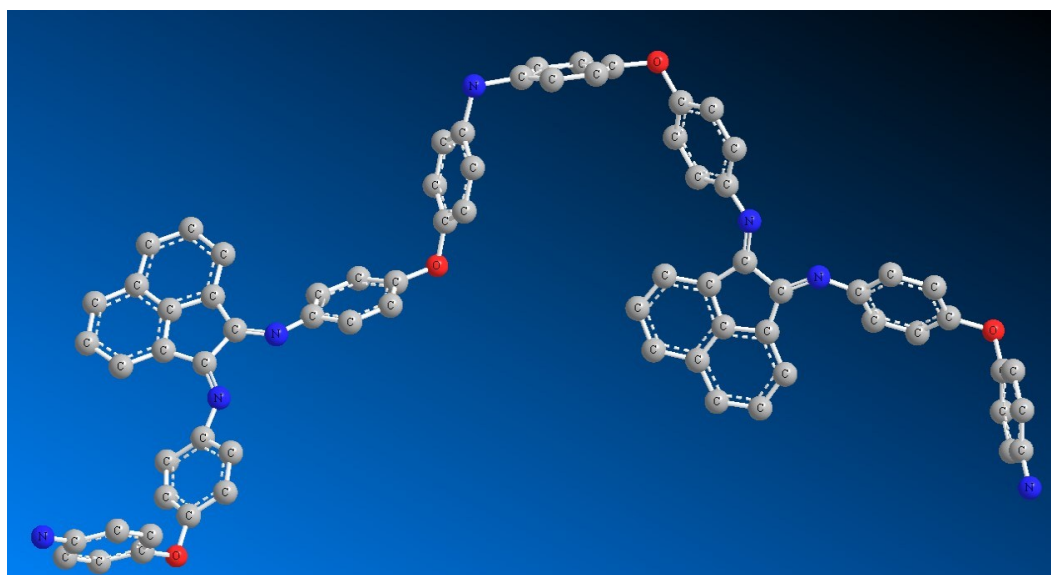
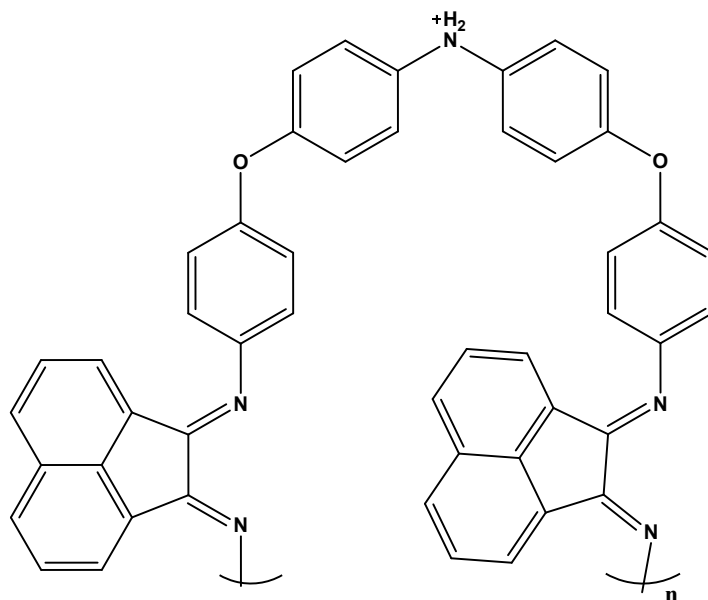


Figure S11. Probable structure of the electropolymerised product and its optimised structure

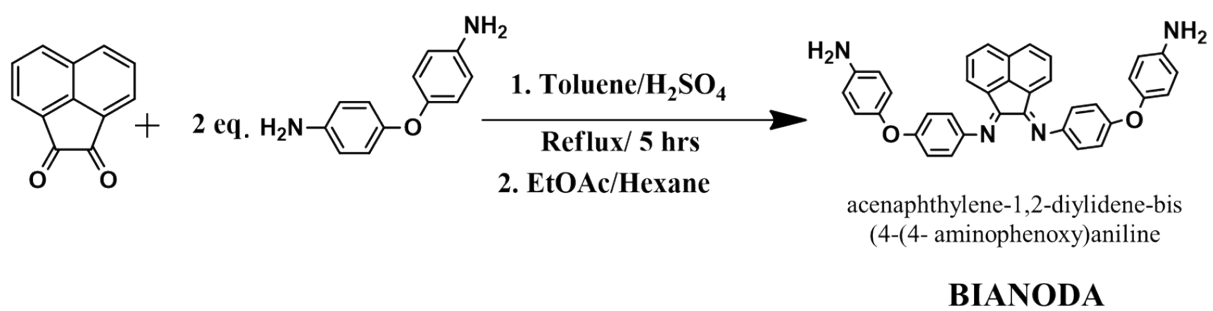


Figure S12. Synthetic route to BIANODA

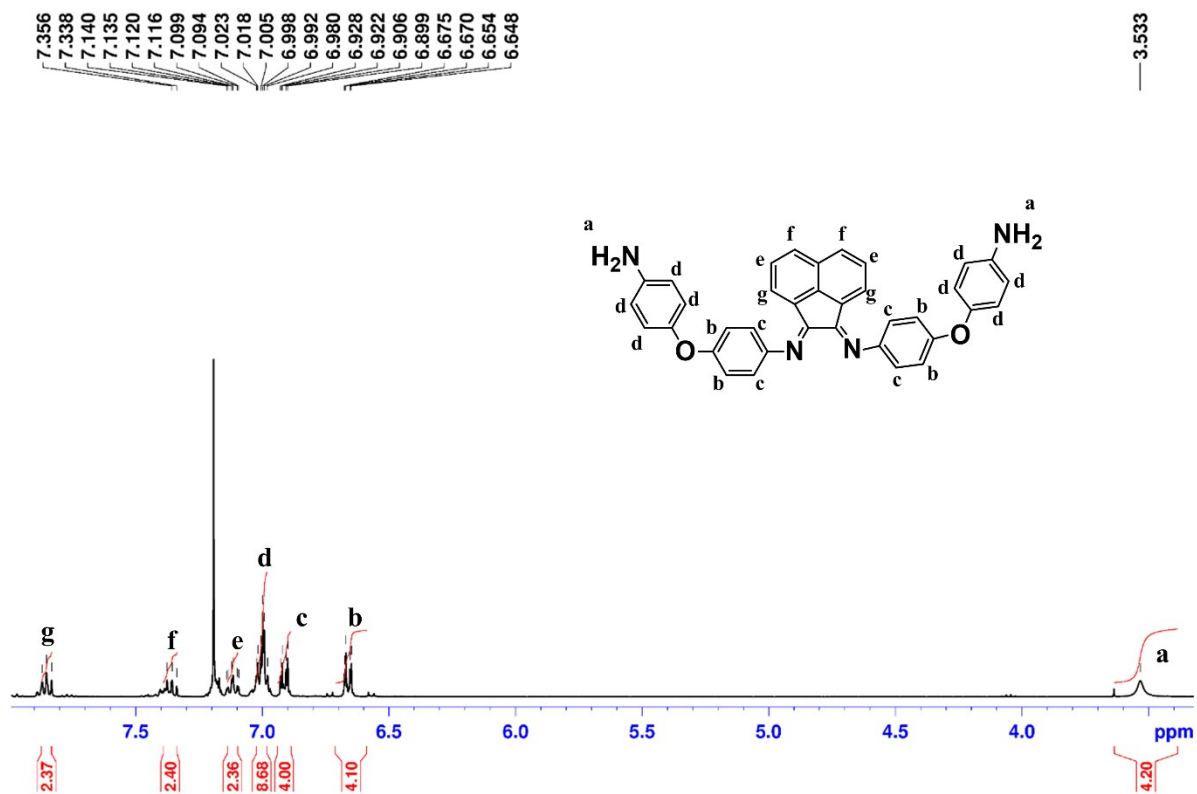


Figure S13. ^1H NMR of BIANODA in CDCl_3

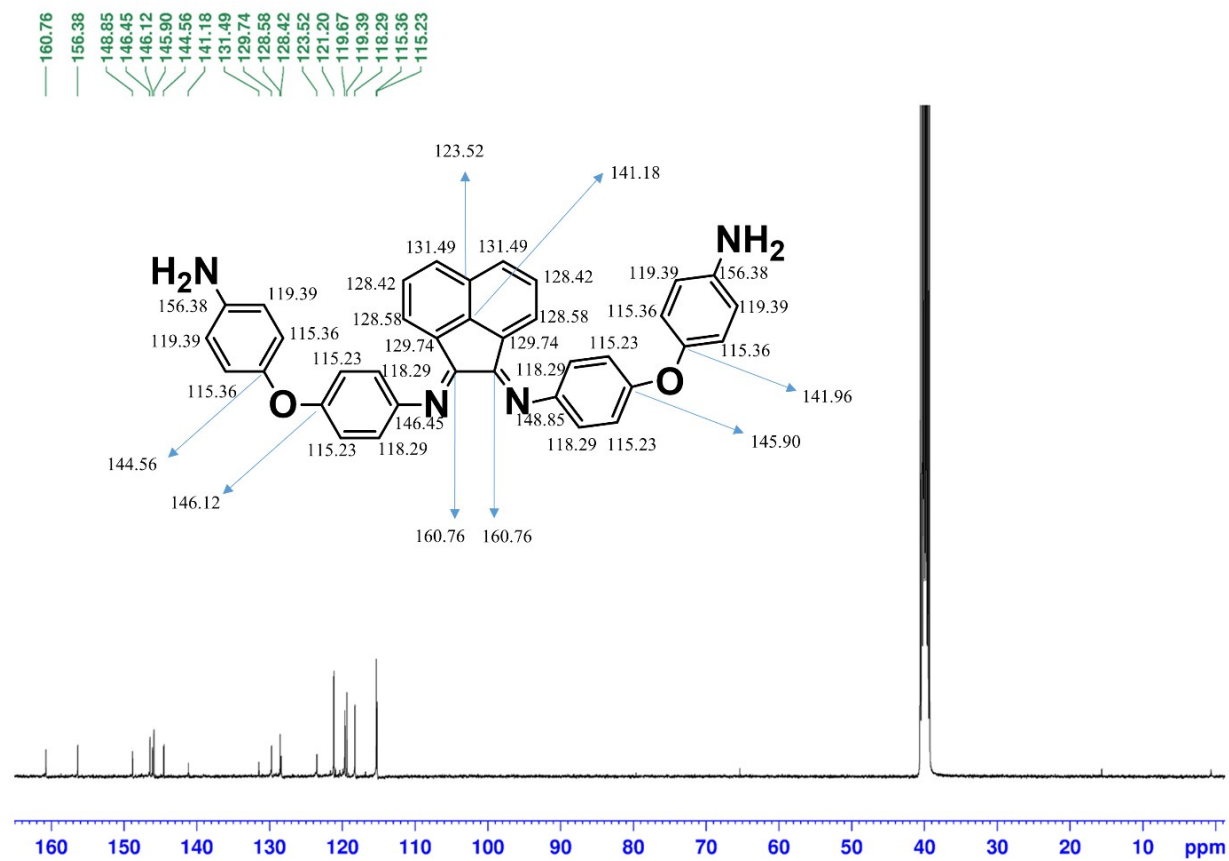


Figure S14. ^{13}C NMR of BIANODA in CDCl_3

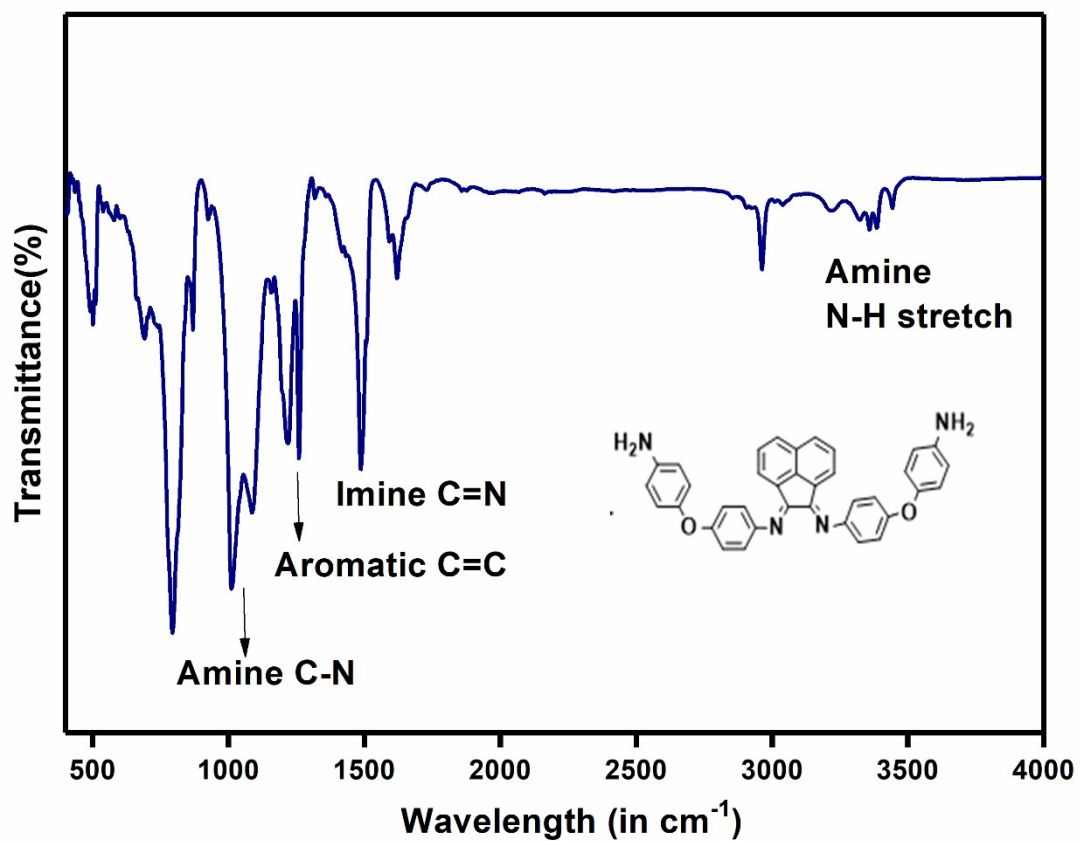


Figure S15. IR spectrum of BIANODA

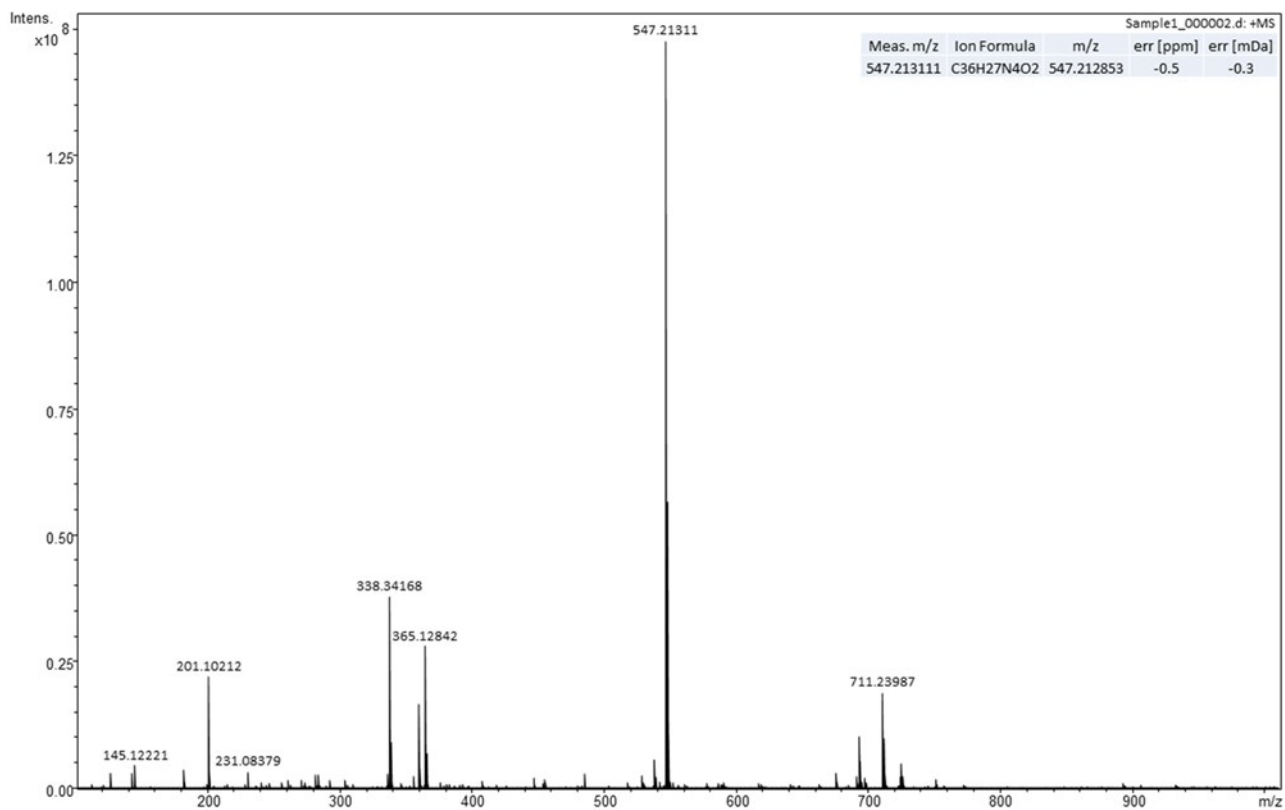


Figure S16. Mass spectrum of BIANODA