

## Preparation of polyacrylonitrile-natural polymer composite precursors for carbon fiber using ionic liquid co solvent solutions

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### Electrospinning method

Electrospinning was performed at room temperature using a laboratory scale electrospinning machine (Electrospinz NZ ltd) without feed rate control at a voltage of 10kV and a spinner to target distance of 100mm, spinner tip size was a 32 gauge needle. The fibers were rinsed with water to remove residual solvent.

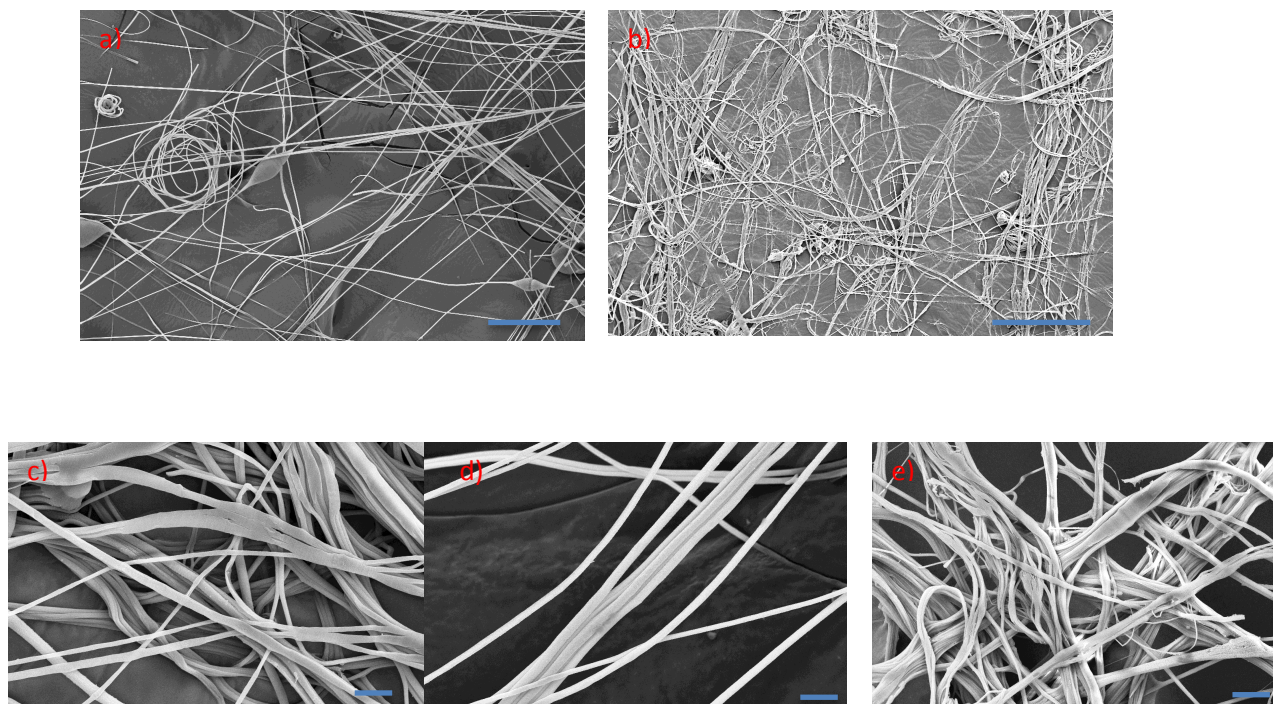
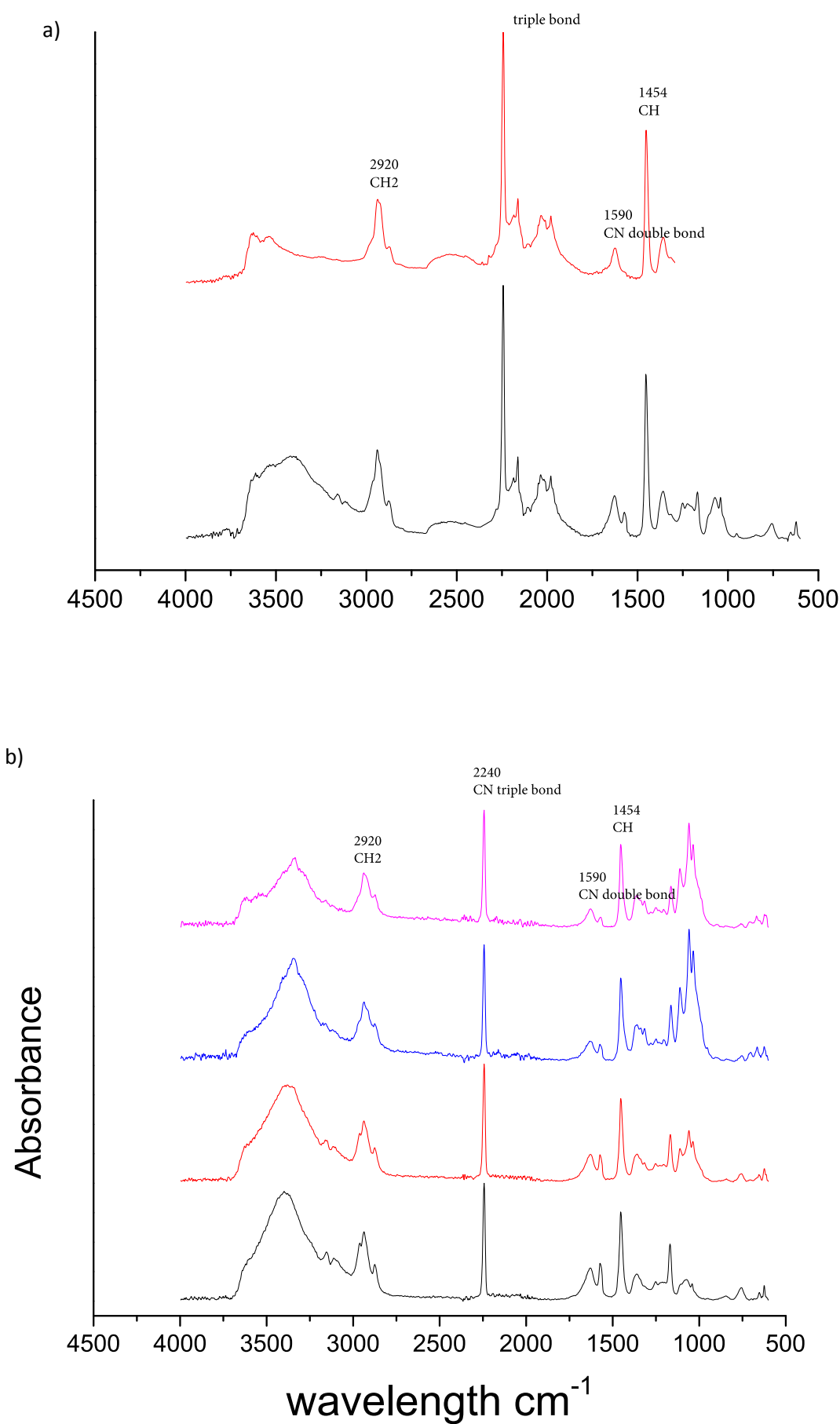
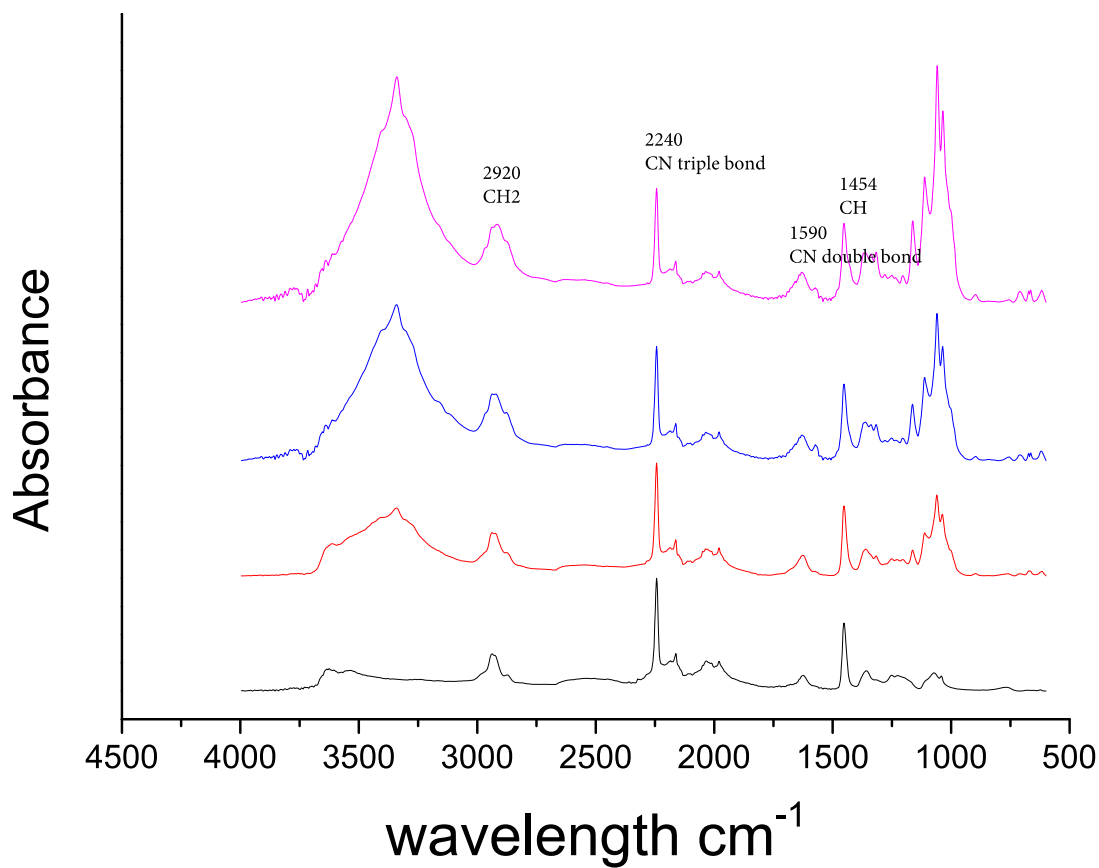


Figure S1: Electrospun PAN from a) 30: 70 v/v DMSO: [BMIM]Cl b) 70: 30 v/v DMSO: [BMIM]Cl c) 10wt%CA:90wt% PAN from 30: 70 v/v DMSO: [BMIM]Cl d) 10wt%CA:90wt% PAN from 70: 30 v/v DMSO: [BMIM]Cl and e) 10wt%RC:90wt% PAN from 30: 70 v/v DMSO: [BMIM]Cl. Scale 6  $\mu$ m



c)



d)

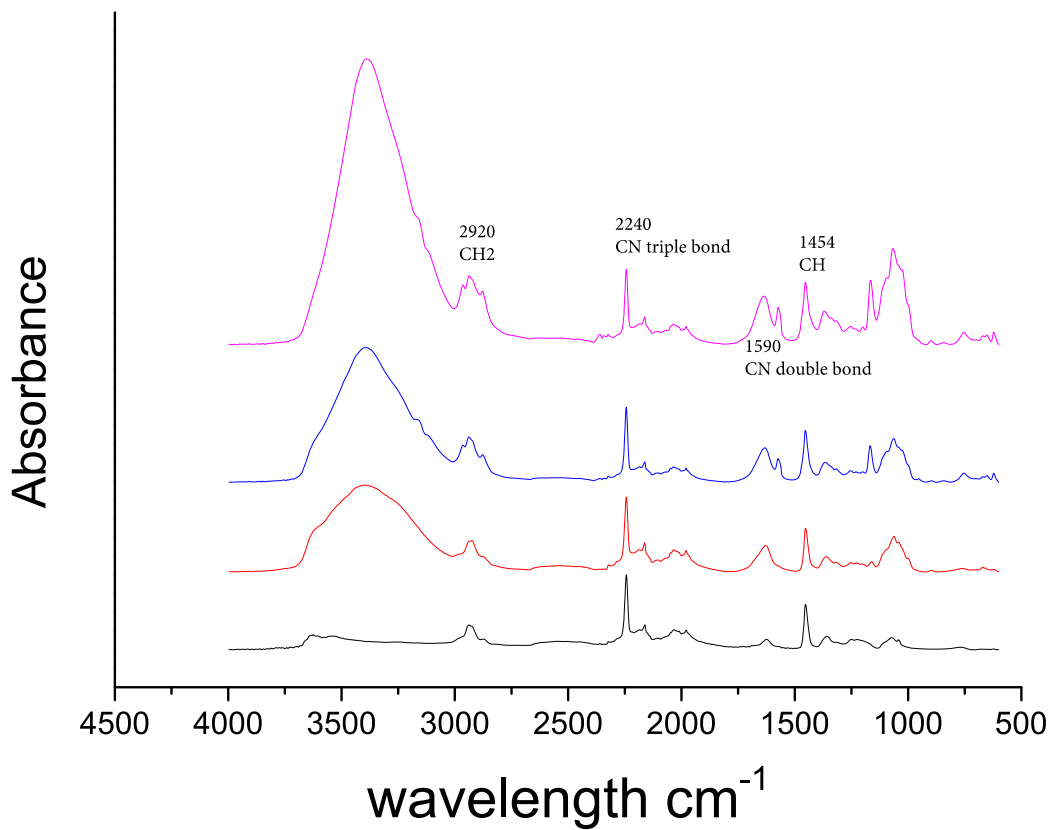
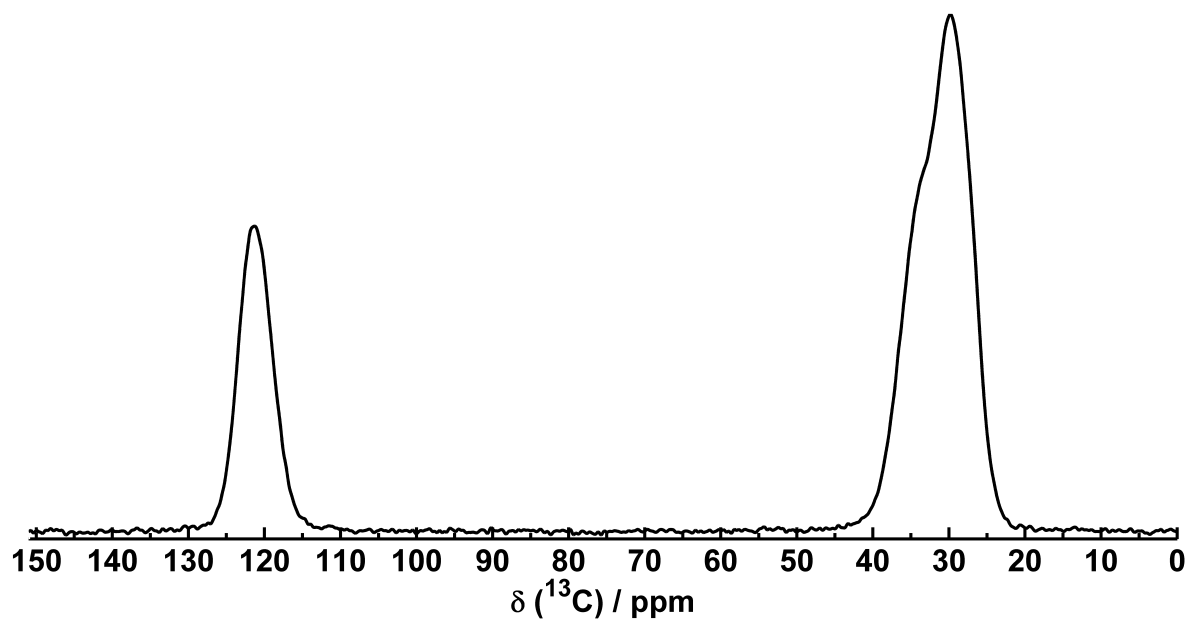


Figure S2: Full FTIR spectra of the various PAN composites where a) 100%PAN dissolved in black 70: 30 v/v DMSO: [BMIM]Cl, red, 30: 70 v/v DMSO: [BMIM]Cl, b) PAN:CA composites dissolved in 70: 30 v/v DMSO: BMIMCl c) PAN:CA composites dissolved in 30: 70 v/v DMSO: [BMIM]Cl, d) PAN:RC composites dissolved in 30: 70 v/v DMSO: [BMIM]Cl



where black is 100% PAN, red is 90%PAN: 10% additive, green, is 80%PAN: 20% additive blue is 70%PAN: 30% additive

Figure S3:  $^{13}\text{C}$  solid state NMR for PAN "as received"