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Intrinsically Electroactive Polyimide Microspheres Fabricated by Electrospraying Technology for Ascorbic Acid Detection

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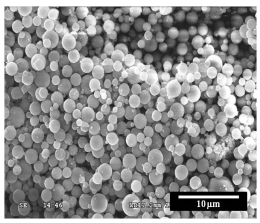
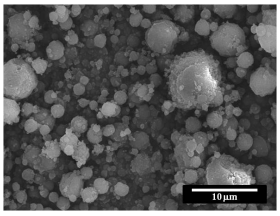
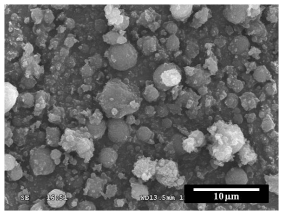
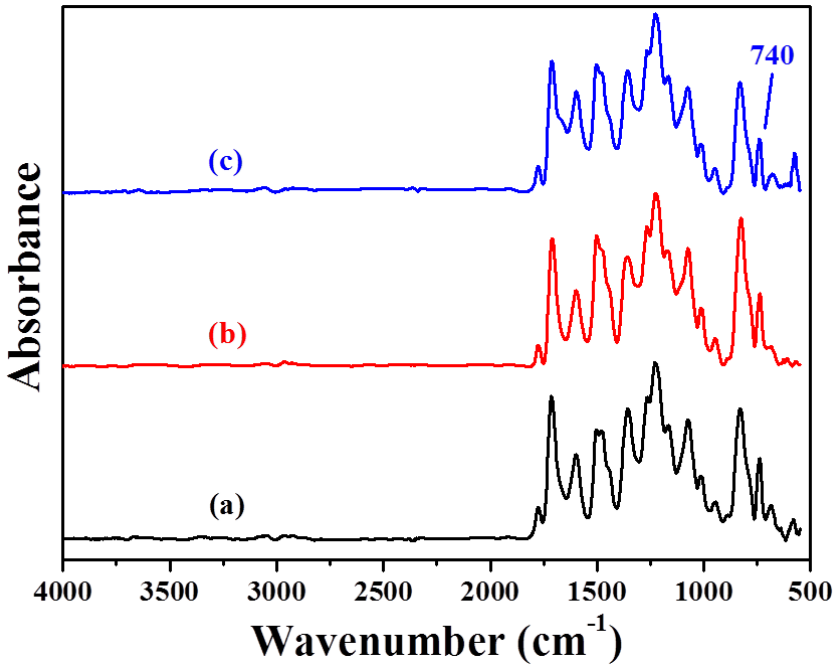
Supporting Information

S-table 1 Solubility of electroactive poly(amic acid)

Compound code	Solvents										
	NMP	DMAc	DMF	THF	$CHCl_3$	NMP/ THF	DMF/ THF	DMAc/ THF	NMP/ $CHCl_3$	DMAc/ $CHCl_3$	DMF/ $CHCl_3$
Poly(amic acid)	++	++	++	±	±	++	++	++	±	±	±

[a] Qualitative solubility was tested with 1mg of a sample in 1ml of stirred solvent. ++ = soluble at room temperature. ; ± = partially soluble.

	DMAc/THF	NMP/THF	DMF/THF
solubility	good	good	good
			
Morphology	Good	Bad	Bad



S-Fig 1 (a) EPS un-treatment (b) EPS exposed to HCl vapor for 5 mins (b) EPS exposed to NH_3 vapor for 5 mins.

In order to confirm the stability of electroactive polyimide sphere which was synthesized by reacting ACAT and 4,4′-(4,4′-isopropylidene-diphenoxy)-bis(phthalic anhydride) (BSAA)under acidic or basic conditions, we design an experiment to prove it. The EPS sample was exposed to HCl vapor and NH_3 vapor for 5 min, respectively. After removing the residual HCl or NH_3 on the surface of EPS sample by water and in 120ºC oven for 1h. We confirmed the EPS chemical structure by FT-IR (ATR). The result was as shown in S-Fig1:

If the EPS underwent hydrolyze after exposed with HCl or NH_3 vapor, the imide ring peak of EPSS at 740 cm^{-1} will disappear or decay and the –OH peak will appear . Compared with EPS without any treatment(S-Fig. 1(a)), the imide ring peak of EPS which was treated with acid (S-Fig. 1(b)) and base (S-Fig. 1(c)) almost didn't decay and the OH peak didn't appear. According to FTIR results, we consider that EPS was stability when it was under acidic or basic conditions.