

Synthesis and properties of processible copolymer microparticles from chloroanilines and aniline

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Table S1. Solubility and solution color of *o*-chloroaniline(OC)/AN and *m*-chloroaniline(MC)/AN copolymer base microparticles with an oxidant [(NH₄)₂S₂O₈]/monomer molar ratio of 1/2 in 1 M HCl

Solvents	Solvent dielectric constant ^c	Solubility ^a and polymer solution color ^b in the parentheses							
		OC/AN molar ratio					MC/AN molar ratio		
		0/100	10/90	50/50	90/10	100/0	10/90	50/50	90/10
H ₂ SO ₄	101	S(BV)	S(BV)	S(BV)	S(BV)	S(BV)	S(BV)	S(BV)	S(BV)
DMSO	47	PS	PS(DB)	PS(DB)	MS(BB)	MS(B)	PS(DB)	MS(BB)	MS(BB)
Formic acid	58	MS(G)	MS(G)	S(G)	S(DG)	S(DG)	MS(G)	S(G)	S(DG)
DMF	38	PS(B)	PS(B)	PS(B)	MS(DB)	MS(DB)	PS(B)	MS(B)	MS(DB)
NMP	32	MS(BB)	MS(BB)	S(BB)	S(BB)	S(BB)	MS(BB)	S(BB)	S(BB)
Acetone	21	IS	SS(BL)	PS(BL)	MS(BL)	MS(BL)	SS(BL)	MS(BL)	PS(BL)
CH ₂ ClCH ₂ Cl	11	SS	SS(SV)	PS(LV)	MS(V)	S(V)	IS	PS(SV)	IS
CH ₂ Cl ₂	9	IS	SS(SV)	MS(V)	MS(V)	S(V)	SS	MS(V)	MS(V)
THF	7	IS	PS(B)	S(B)	S(B)	S(B)	MS(B)	S(B)	S(B)
CHCl ₃	5	SS	PS(SV)	MS(V)	MS(DV)	MS(DV)	PS(SV)	S(V)	PS(DV)

a: IS= insoluble; MS= mainly soluble; PS= partially soluble; S= soluble; SS=slightly soluble.

The letters in parentheses indicate the solution color of the copolymers in the solvents:

B=blue; BB= bluish black; BL =black; BV= bluish violet; DG=dark green; DV= dark violet;

G=green; SV=slightly violet.

Table S2. The membrane formability of the OC/AN and MC/AN copolymer base microparticles in NMP by solution casting method on glass and the characteristics of the membranes formed

OC/AN molar ratio	0/100	10/90	30/70	50/50	70/30	90/10	100/0
Membrane formability	Good	Excellent	Good	Good	Good	Good	Good
Membrane toughness	Good	Excellent	Good	Fair	Poor	Very poor	Very poor
Membrane color	Purple ^a	Purple ^a	Purple ^a	Purple ^a	Purple ^a	Black	Black
Membrane appearance	Smooth, copper luster	Smooth, copper luster	Smooth, copper luster	Smooth, copper luster	Smooth, copper luster	Smooth, slight luster	Smooth, slight luster
MC/AN molar ratio	0/100	10/90	30/70	50/50	70/30	90/10	96/4
Membrane formability	Good	Excellent	Excellent	Good	Good	Good	Fair
Membrane toughness	Good	Excellent	Excellent	Fair	Poor	Very poor	Very poor
Membrane color	Purple ^a	Purple ^a	Purple ^a	Purple ^a	Purple ^a	Black	Black
Membrane appearance	Smooth, copper luster	Smooth, copper luster	Smooth, copper luster	Smooth, copper luster	Smooth, copper luster	Smooth, slight luster	Smooth

a: Their HCl-doped membranes are bluish black and also strongly metallic lustrous.

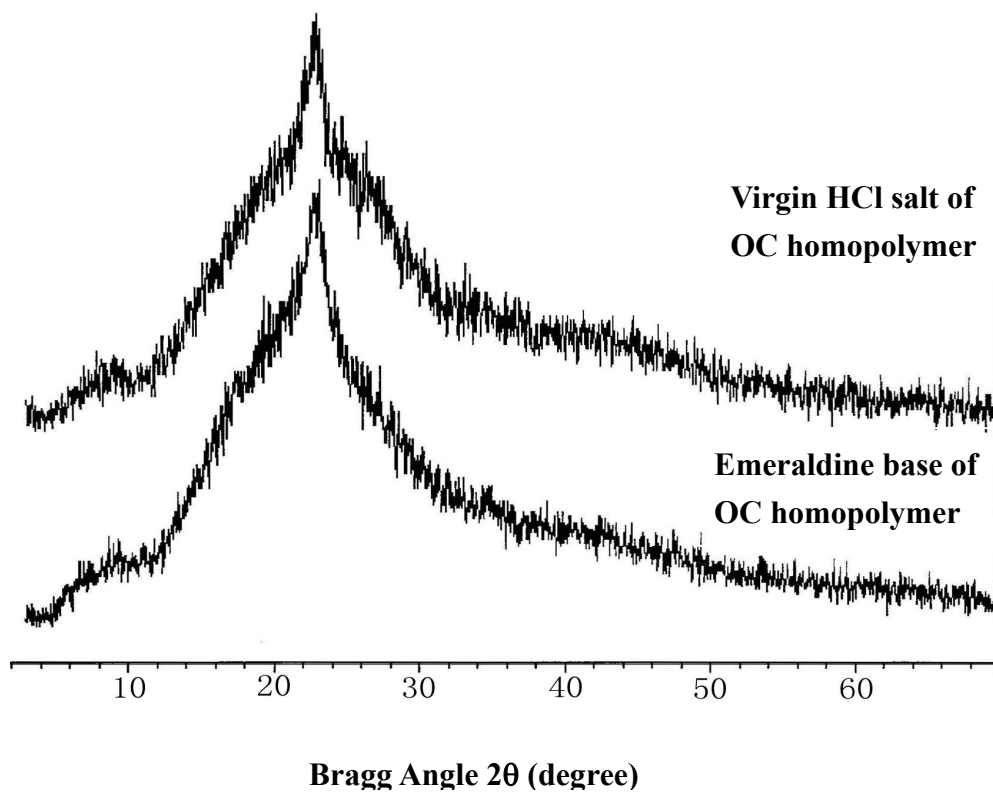


Fig. S1 Wide-angle X-ray diffractograms of the virgin HCl salt and emeraldine base of OC homopolymer microparticles

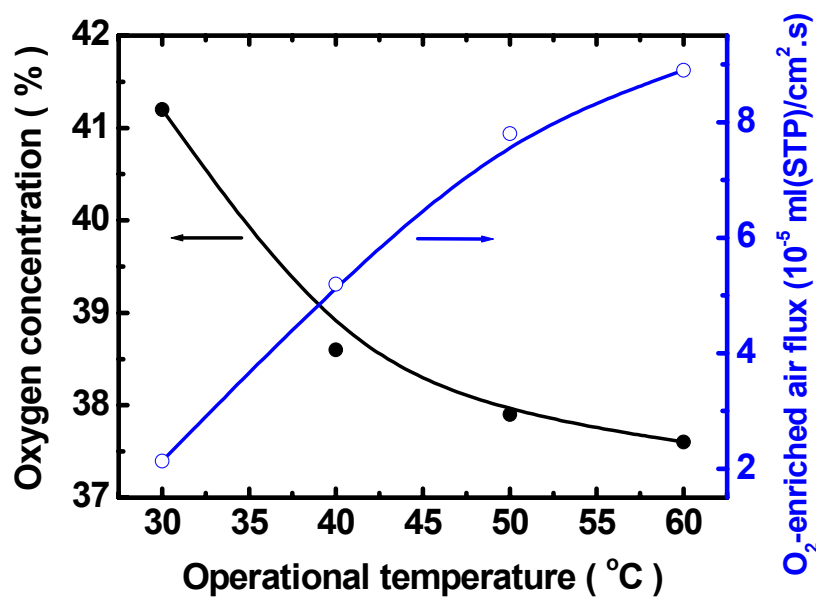


Fig. S2 Actual air-separation performance through the blend membranes of the MC/AN(30/70) copolymer and 90 wt% ethylcellulose(EC) with operational temperature