Tailoring the structure of Polysulfone nanocomposite membranes by incorporating Iron oxide doped Aluminium Oxide for excellent separation performance and antifouling property

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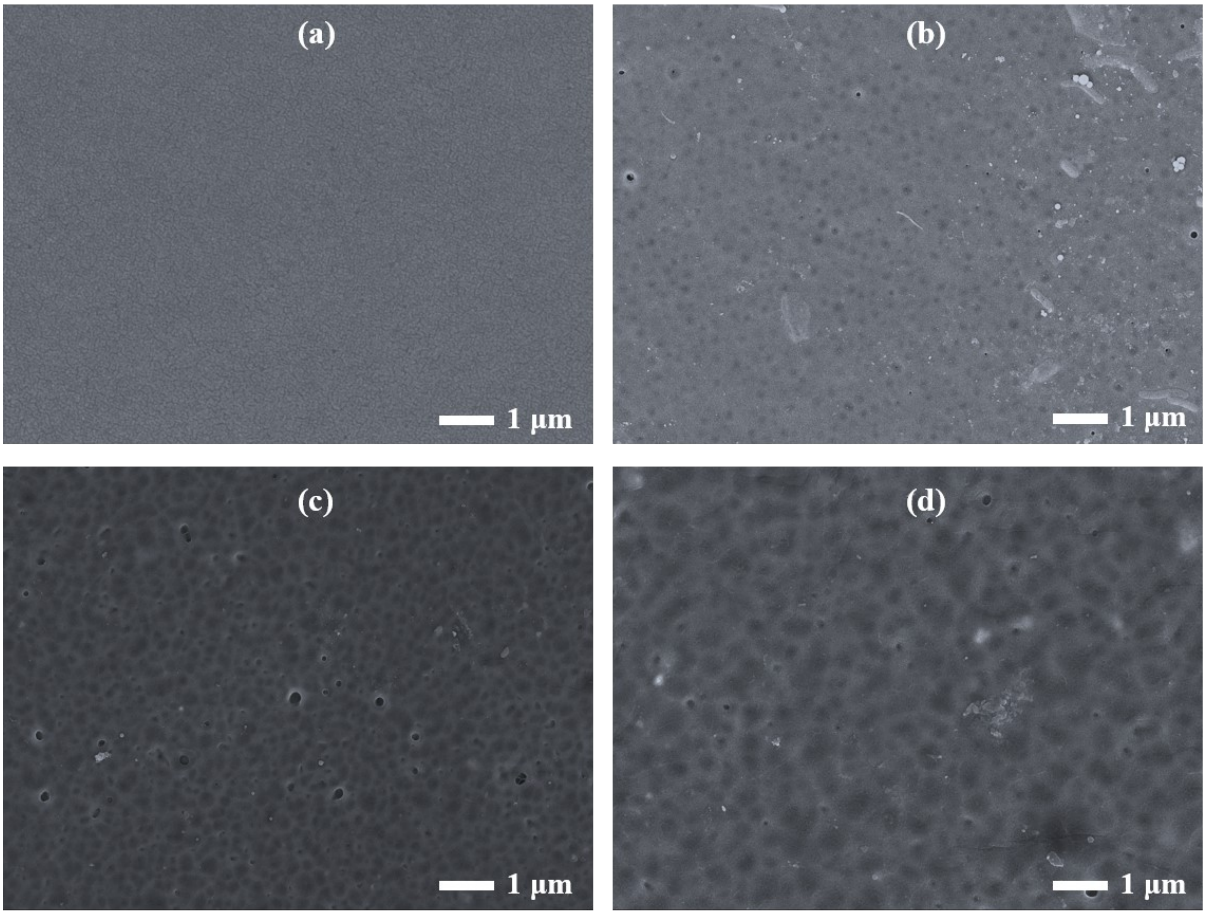

Figure S1: Surface FESEM images of (a) F_0 (b) F_1 (c) F_2 (d) F_3

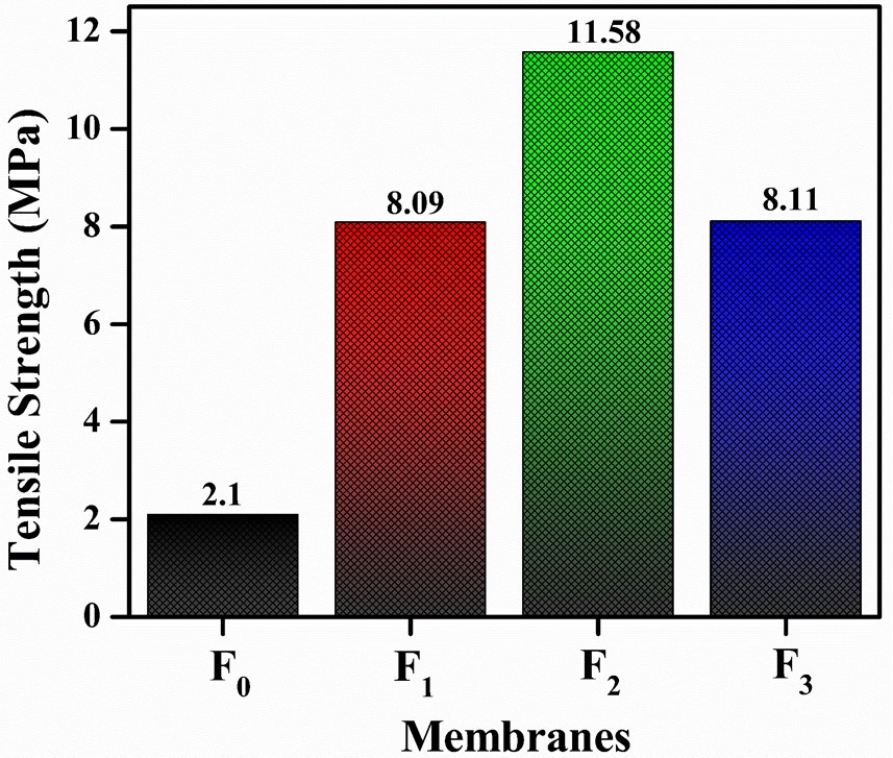

Figure S2: Tensile Strength of (a) F_0 (b) F_1 (c) F_2 (d) F_3

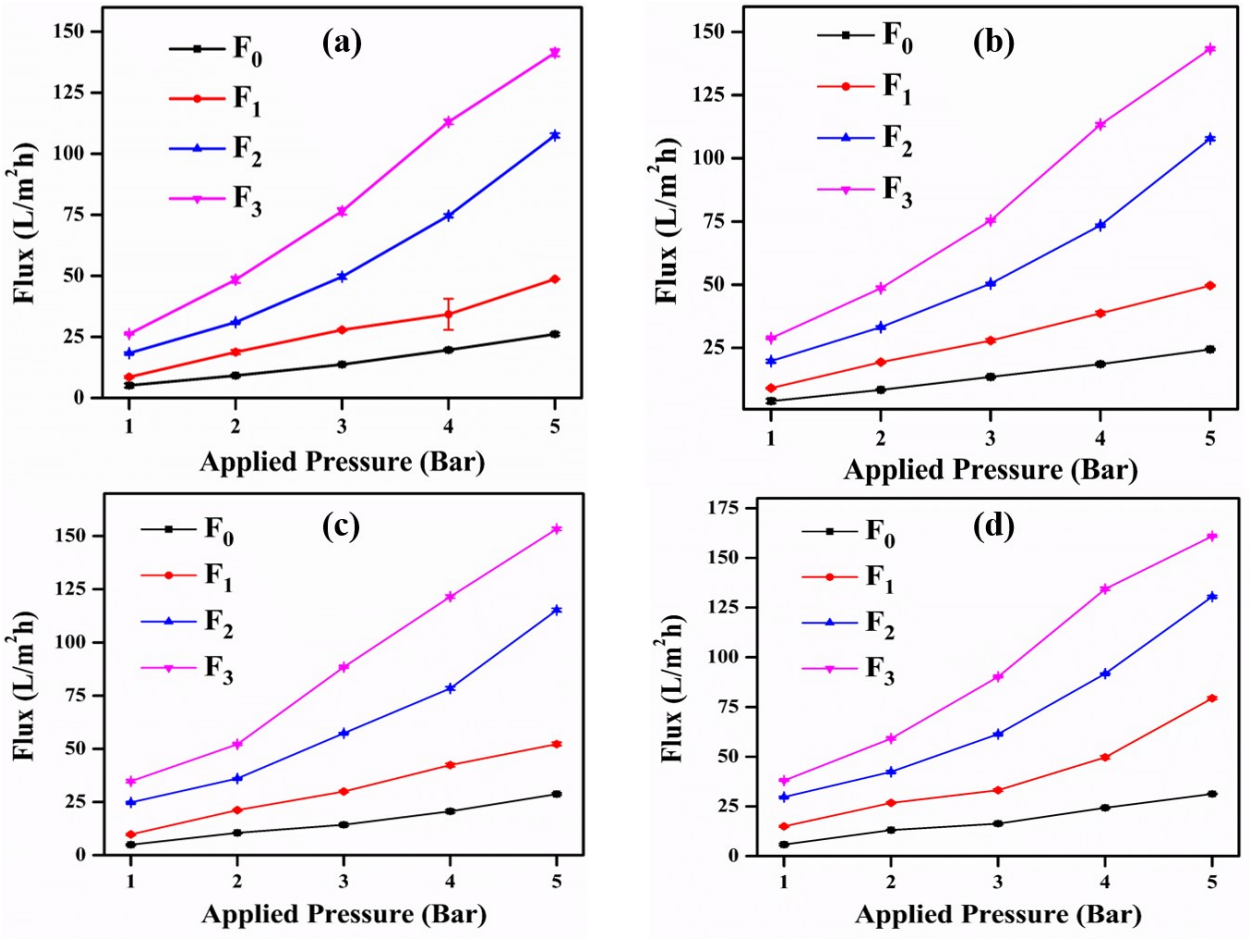

Figure S3. Permeate flux of (a) lead (b) Cadmium, (c) Mercury and (d) Fluoride

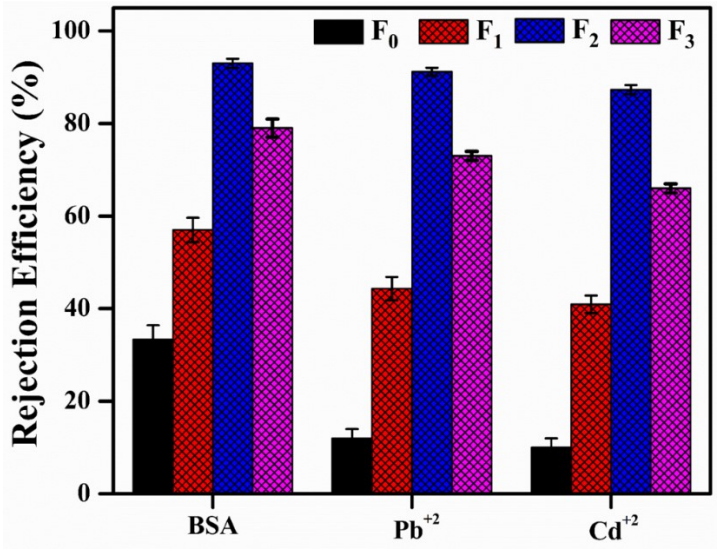

Figure S4: Rejection efficiency of the fabricated membranes during antifouling study.

Table S1: Compositions of the fabricated membranes

Membranes	PSf (g)	Fe: Al_2O_3(wt%)	NMP (mL)
F_0	4.0	0	16
F_1	3.9	0.625	16
F_2	3.8	1.25	16
F_3	3.7	1.875	16

Table S2: Water Uptake and Porosity of the fabricated membranes

Membranes	Water Uptake (%)	Porosity (%)
F_0	11.2±2	36.1±2
F_1	20.2±1	44.3±1
F_2	26.5±2	54.6±1
F_3	31.3±1.5	79.4±2

Table S3: Antifouling properties of fabricated Fe:Al_2O_3/PSf nanocomposite membranes compared with of various other nanocomposite membranes

Type of nanocomposite membranes	**Nanoparticles dosage (wt%)**	**FRR (%)**	**Total Fouling (%)**	**Reference**
Cellulose Acetate/ZrO_2	7	71	2.58	[1]
PVDF/ZnO	1	50	-	[2]
Silica-PVP	1	85	35	[3]
Titania NPs/PES	1	75	7.29	[4]
PVDF- MnO_2	2	93.5	-	[5]
GO/PPSU	2	88±4.2	34	[6]
Pluronic F127/PEI	3	73.3	50	[7]
MXene/PSf	500mg	76	84	[8]
Boron nitride/PSf	2	82	-	[9]
Isocyanate treated GO/PSf	0.05	40	-	[10]
SiO_2-GO/PSf	0.3	72	-	[11]
Fe:Al_2O_3/PSf	**1.25 wt%**	**89**	**37.65**	**This work**

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