Electronic Supplementary Information

Table S1 Properties of relevant N6 solutions.

Polymer	Concentration (wt%)	Viscosity (cps)	Conductivity (mS/cm)	Surface tension (mN/m)
N6	10	980	2.73	34.42
	12.5	1304	3.17	32.23
	15	2749	4.74	30.67
	17.5	4401	5.06	29.32

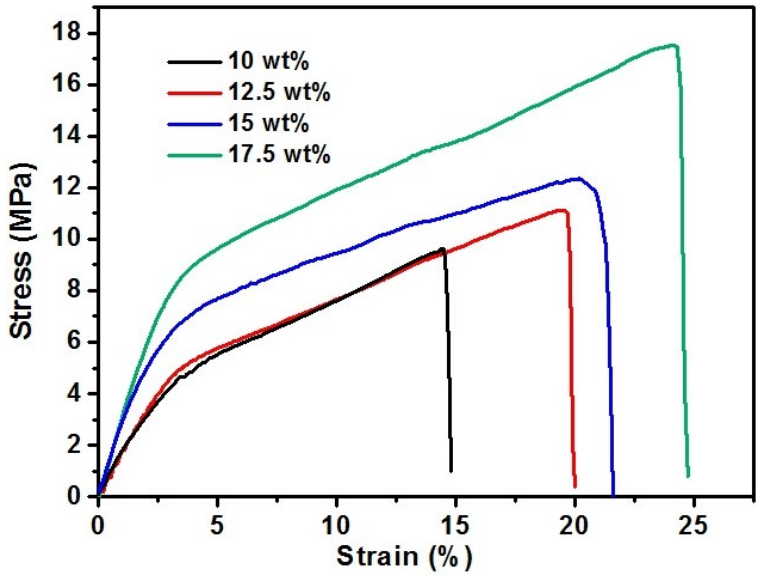

Fig. S1 Stress-strain curves of as-prepared N6 membranes fabricated from varied concentrations.

Table S2 Porous structure characteristics of N6-PAN NNB membranes obtained from the capillary flow porometer.

Samples	Maximum pore size (nm)	Mean pore size (nm)	Porosity (%)	Average thickness (μm)
N6-PAN$_{4/0}$	241	188	66.89	25.4
N6-PAN$_{3/1}$	256	231	73.10	26.3
N6-PAN$_{2/2}$	303	276	86.92	24.2
N6-PAN$_{1/3}$	387	370	89.83	25.8
N6-PAN$_{0/4}$	785	756	91.87	24.9
N6-PAN$_{2/2}$*	272	265	87.11	36.6
N6-PAN$_{2/2}$**	254	242	89.02	48.7

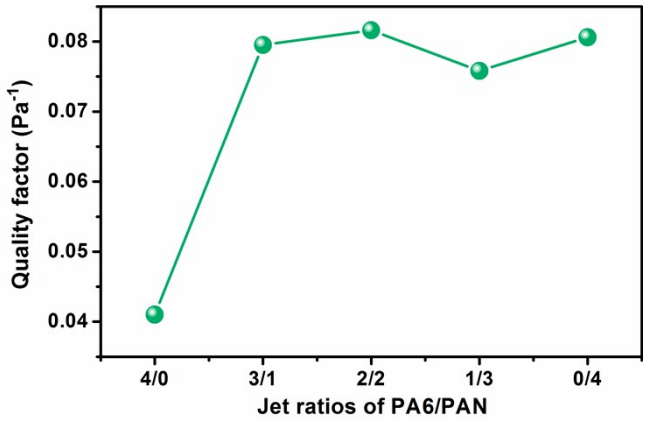

Fig. S2 Quality factor of N6-PAN NNB composite membranes fabricated from varied jet ratios.

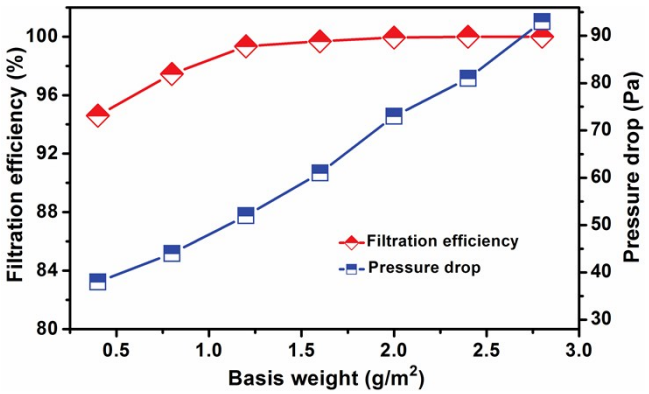

Fig. S3 Filtration performance of N6-$PAN_{2/2}$ NNB membranes with various fibre basis weights.

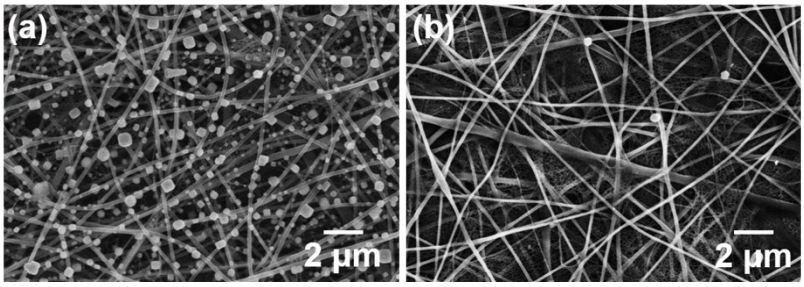

Fig. S4 Top view of N6-15 NFN and N6-PAN NNB membranes after NaCl aerosol particle loading for 1 min under the air flow rate of 30L/min.