

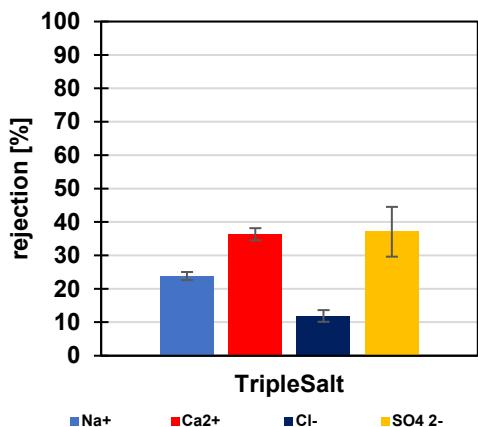
Supporting Information

# **Polystyrene sulfonate particles as building blocks for nanofiltration membranes**

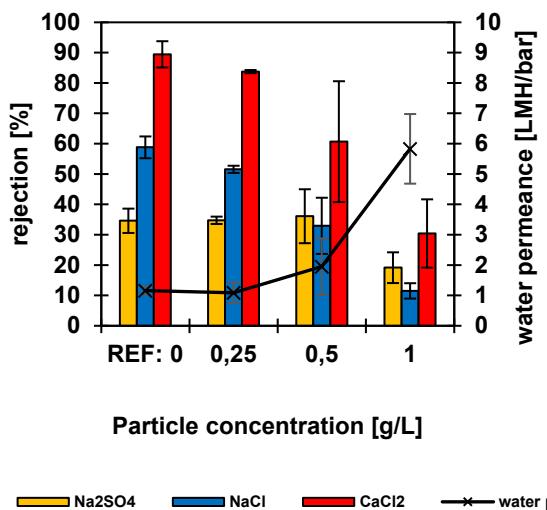
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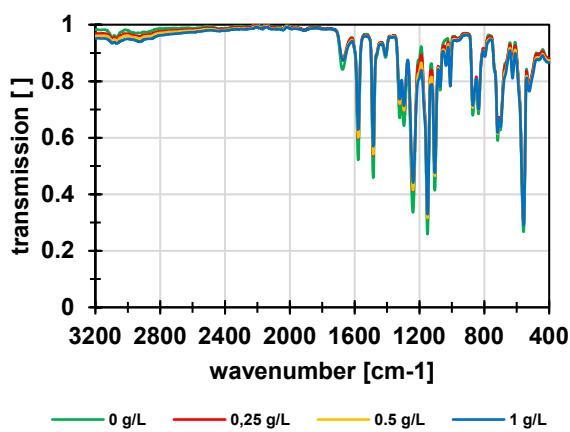
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**Figure S1.** Water permeance and rejection of individual ions in a mixture of three salts for the composite membrane obtained by coating at PSSA particle concentration of 0.25 g/L and PEI and GDE concentrations of 0.5 g/L and 1 g/L, respectively (cf. Figure 5).



**Figure S2.** Influence of the variation of PSSA particle content in ethanol used for coating the porous PES support membrane onto water permeance and rejection of single salts. The PEI and GDE contents were 1 g/L (= second series of experiments).



**Figure S3.** Complete IR spectra of NF membranes from first series.

**Table S1.** Overview on literature data regarding separation performance for other polyelectrolyte complex nanofiltration membranes in comparison with the charge-balanced membranes obtained in this work.

Membrane <sup>#</sup>	Reference	Water permeance [LMH/bar]	Rejection (%) (MgSO <sub>4</sub> )	Rejection (%) (Na <sub>2</sub> SO <sub>4</sub> )	Rejection (%) (MgCl <sub>2</sub> )	Rejection (%) (NaCl)
dNF40	NX Filtration <sup>1</sup> [32]	5.8	91	-	-	-
dNF80	NX Filtration <sup>1</sup>	-	76	-	-	-
G-CNTm (8:3)	Y. Han et al. [33]	9.5	40.6	83.5	18.7	48.1
GNm	Y. Han et al. [33]	4.8	82.8	95.1	31.7	59
LBL*1.5C	R. Wang et al. [34]	10	97.4	95.2	98.2	33.5
(PDADAMAC/PSS) <sub>7</sub> @ 0.05 M NaCl	J. de Groot et. al. [35]	15.6	-	96	~5*	71
(PDADAMAC/PSS) <sub>7</sub> PDADA MAC @ 0.5 M NaCl	J. de Groot et. al. [35]	10.3	-	~17	79*	~20
(PSS/PEI) <sub>10</sub> @ 0.05 M NaCl	M. Reurink et. al. [36]	4	~98	~99	~58	~85
(PSS/PAH) <sub>10</sub> @ 0.05 M NaCl	M. Reurink et. al. [36]	9	~96	~85	~98	~55
(PSS/PAS) <sub>10</sub> @ 0.05 M NaCl	M. Reurink et. al. [36]	22	~70	~95	~20	~40
(PEI/PAA) <sub>5.5</sub> crosslinked	Y. Liu et. al. [37]	~1.4	~80	-	~95	~68
1 g/L PEI; 1 g/L PSSA; 1 g/L GDE	this work	1.9		36	61*	33
0.5 g/L PEI; 1 g/L PSSA; 1 g/L GDE	this work	1		52	50*	27

<sup>#</sup> multiwalled carbon nanotubes (MWNT)-intercalated graphene nanofiltration membrane (GCNTm); neat graphene nanofiltration membrane (GNm); poly(diallyldimethylammonium chloride) PDADAMAC; poly(styrene sulfonate) (PSS); poly(allylamine hydrochloric acid) (PAH); poly(4-aminostyrene) (PAS); polyacrylic acid (PAA), polyethylenimine (PEI), glycerol diglycidyl ether (GDE)

\*CaCl<sub>2</sub>

<sup>1</sup> Data sheets from NX Filtration

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