

## Electronic Supporting Information

### Correlating PSf Support Physicochemical Properties with the Formation of Piperazine-Based Polyamide and Evaluating the Resultant Nanofiltration Membrane Performance

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The bulk porosity lists in the Table 1S. The PEG MW did not affect the bulk porosity (82.0–86.2 % range). For low-MW PEG, the majority of PEG was readily removed during the phase-inversion process, leaving behind a small amount of PEG. However, for high-MW PEG, the majority of PEG was retained in the support, and although the amount of PEG removed was smaller (compared with the case of low-MW PEG), its MW was higher, leading to the formation of bigger pores. Therefore, the effect of PEG MW on the bulk porosity was not substantial.

Table S1. Physical characteristics of PSf support prepared using PEG with varying molecular weights.

Membrane	Bulk porosity (%)			Total membrane thickness <sup>a</sup> (μm)			Skin layer thickness <sup>b</sup> (nm)		
PSf	85.8	±	1.9	41.6	±	4.6	452.8	±	20.6
PSf-PEG200	86.2	±	2.3	48.1	±	2.8	719.2	±	16.1
PSf-PEG1k	82.0	±	2.1	51.7	±	5.7	860.9	±	33.6
PSf-PEG10k	85.2	±	2.0	62.9	±	2.4	2569.9	±	204.1
PSf-PEG20k	86.8	±	0.7	63.8	±	6.7	7466.8	±	300.3
PSf-PEG35k	85.5	±	2.0	66.8	±	4.1	18318.6	±	1030.2

<sup>a</sup>excludes nonwoven layer.

<sup>b</sup>measured from surface to macrovoid tip.