

### Preparation and characterization of comb-like copolymer for nanofiltration membrane

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The synthesis and the characterization of crosslinked comb-like copolymer, i.e. a poly(vinylidene fluoride) (PVDF) support. The comb-like copolymer comprising poly(vinyl chloride) backbone and poly(styrene sulfonic acid) side chains was sequentially synthesized via atom transfer radical polymerization (ATRP). The successful “grafting from” method and the nanophase separated structure of the graft copolymer were confirmed by transmission electron microscopy (TEM). Wide angle X-ray scattering (WAXS) also showed the decrease in the crystallinity of PVDF upon graft copolymerization. The rejections of NF membranes containing 47wt% of PSSA were 83% for  $\text{Na}_2\text{SO}_4$  and 28% for NaCl, and the solution flux were 18 and 32  $\text{L/m}^2 \text{ hr}$ , respectively, at 0.3MPa pressure.