# Supporting information

# How to easily adapt cloud points of statistical thermosensitive polyacrylamide-based copolymers knowing reactivity ratios

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**Synthesis of poly(N-*n*-propylacrylamide-*block*-diethyl 2-(acrylamido)ethylphosphonate) (poly(N*n*PAAm-*block*-DAAmEP)) by RAFT polymerization**
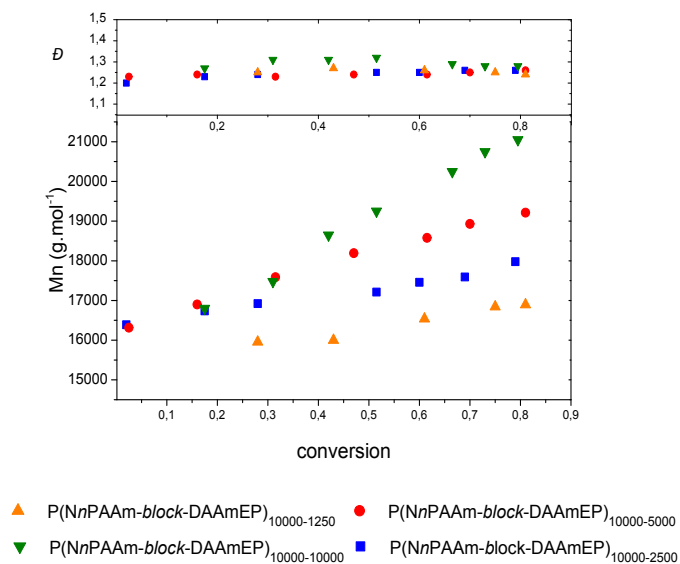


**Fig. S1** Evolution of molecular weight with conversion for the RAFT polymerization of DAAmEP. N*n*PAAm is used as macro-chain transfer agent.
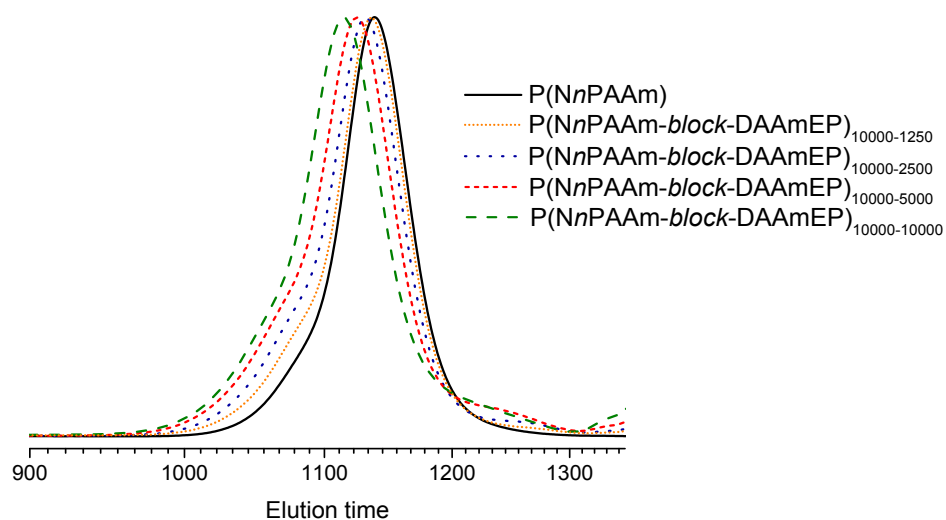


**Fig. S2** Size exclusion chromatograms of P(N*n*PAAm) macro-chain transfer agent and P(N*n*PAAm-*block*-DAAmEP) diblock copolymers with different molecular weights.

**Method used for the determination of the sorption properties**

Sorption experiments were carried out using dialysis: 10 mL of copolymer aqueous solution of increasing concentrations (from 1.25 g.L$^{-1}$ to 10 g.L$^{-1}$) were introduced in a tubular ester cellulose dialysis membrane (molecular weight cut-off of 2 000 Da). The latter was then immersed in a 100 mL bulk solution containing 20 mg.L$^{-1}$ of Ni$^{2+}$ ions, as shown in Figure S3. The copolymer in the inner solution could not migrate in the bulk solution because the molecular weight of copolymer chains was higher than the molecular weight cut-off of the dialysis membrane. The copolymer in the inner solution could not migrate in the bulk solution because the molecular weight of copolymer chains was higher than the molecular weight cut-off of the dialysis membrane. The amount of Ni$^{2+}$ ions trapped by the copolymer was determined by measuring the concentration of Ni cations in the bulk solution before and after sorption experiments. The metal ion concentration was determined by Atomic Sorption Spectroscopy with a Perkin Elmer AAnalyst 400, an AutoPrep 50 dilutor and a S10 Auto-sampler. Calibration curves were obtained by automatic dilution of a 100 mg.L$^{-1}$ standard nickel solution.A blank experiment was conducted (using pure water in the dialysis membrane) in order to take into account the dilution factor.
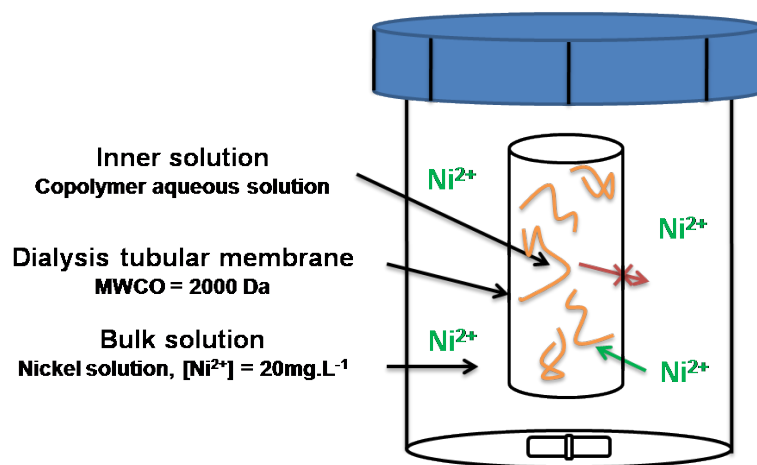


**Fig. S3** Determination of sorption properties, dialysis procedure.