

Supporting Information

Charge-based separation of acid-functional polymers using non-aqueous capillary electrophoresis employing deprotonation and heteroconjugation approaches.

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S1: Experimental details polymer synthesis

S1.1: Synthesis of water-borne methacrylic polymers

Methacrylic copolymers were synthesized by reacting MMA with MAA in various ratios (ϕ , see Table 1) using emulsion polymerization. Water containing 2.3% by weight sodium lauryl sulfonate was heated to 80 °C prior to addition of the monomer seed (i.e. a pre-formed polymer dispersion), which contains 5% by weight of the total monomer feed. The targeted total concentration of polymer is 30% by weight in water. Directly after addition of the monomer feed, 0.5% (based on the weight of monomer) of ammonium persulphate was slowly added to the mixture during three minutes to initiate the reaction. The remaining 95% of the monomer feed (containing 0.5 % by weight of 1-dodecane thiol as chain transfer agent) was added during 90 minutes, while increasing and maintaining the reaction temperature at 85 °C. The same temperature was maintained for 60 minutes after completion of the monomer feed. Thereafter, the batch was cooled to 30 °C. At this stage, neutralizing agent (25% by weight of ammonia in water) was added until a pH between 7.5-8.5 was obtained.

S1.2: Synthesis of water-borne urethane polymers

Urethane polymers were prepared by reacting IPDI with a polyol mixture, consisting of PPG and DMPA (ϕ , displayed in Table 1). Synthesis was performed in two stages: prepolymer formation and dispersion/extension. An isocyanate-functional prepolymer was prepared by reacting the IPDI/PPG mixture using bismuth neodecanoate as catalyst. Reaction temperature was kept at 90 °C for two hours, after which the temperature was decreased to 80 °C for one hour. TEA was added to the prepolymer prior to dispersion stage. The prepolymer was gradually added to

water in 45 minutes, keeping the sample temperature between 20-25°C. Urethane extension was performed by addition of N2H4, which resulted in a temperature increase of 5°C. Samples were mixed for one hour, after which the end samples were obtained (pH around 7.5, percentage of resin in water 18-20%).

S2: Degradation of fused-silica capillaries using high pH-conditions combined with NMP.

The information below is related to the Results and Discussion section, paragraph “Non-Aqueous CE using high pH conditions”

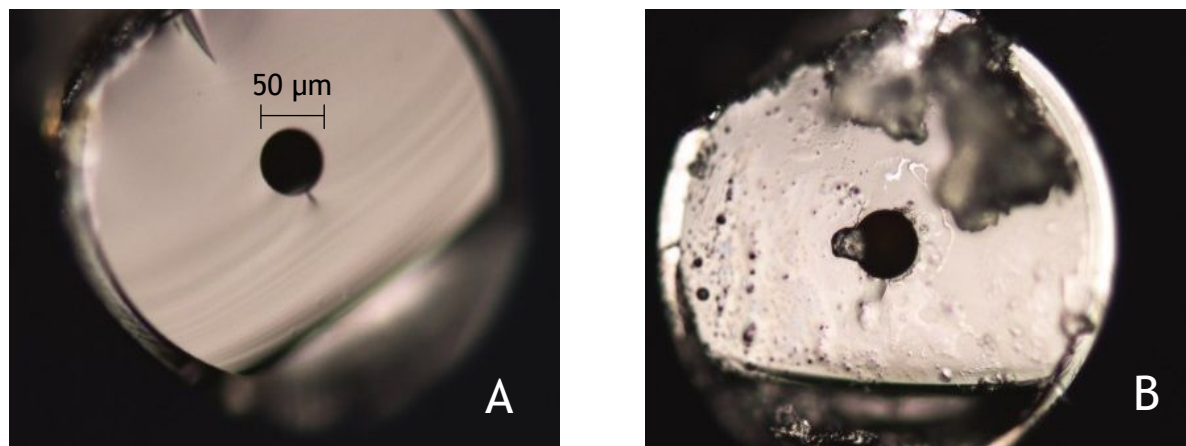


Figure S2. Cross-cut of a 50 µm fused-silica capillary. A: unused capillary. B: capillary after 30 injections of 50 mM TBAH in NMP.

S3: Effective mobility plot of model polymers, separated using heteroconjugation (20mM anion concentration)

The information below is related to the Results and Discussion section, paragraph “Non-Aqueous CE using heteroconjugated anions”

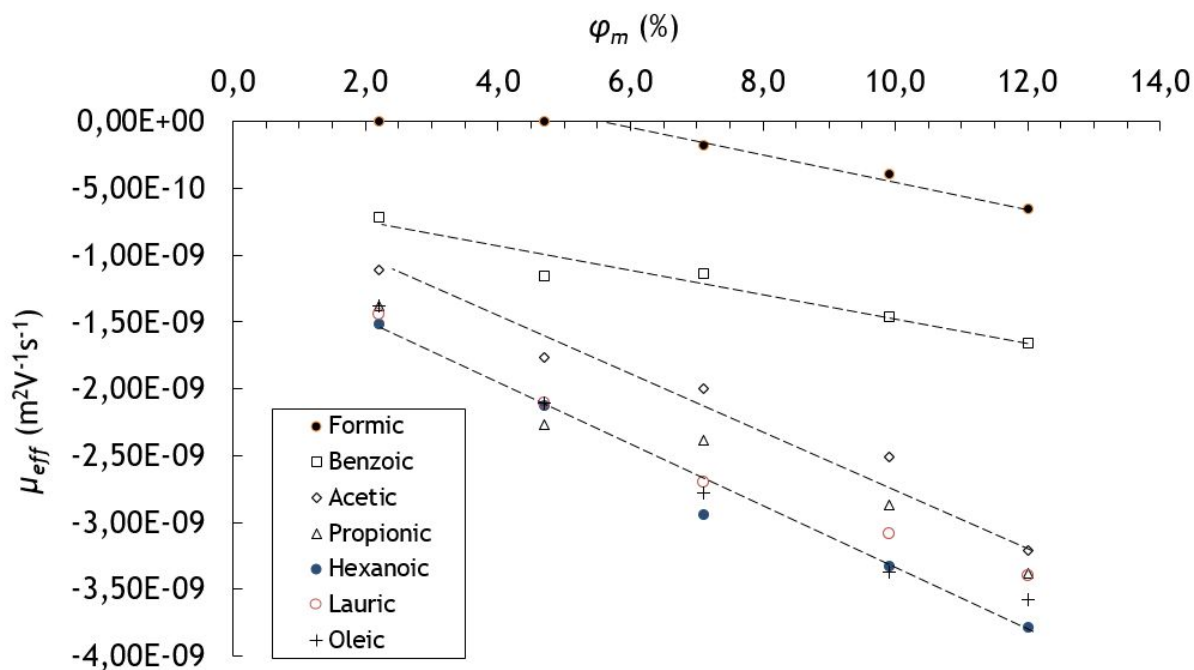


Figure S3. Plot of effective mobility vs. acid content φ_m of copolymers pMMA-co-MAA-1 to 5, using a 20 mM anion concentration. Conditions as defined in the Experimental section. The dashed lines are a guide to the eye.