Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Alkali-stable and highly anion conducting poly(phenylene oxide)s carrying quaternary piperidinium cations

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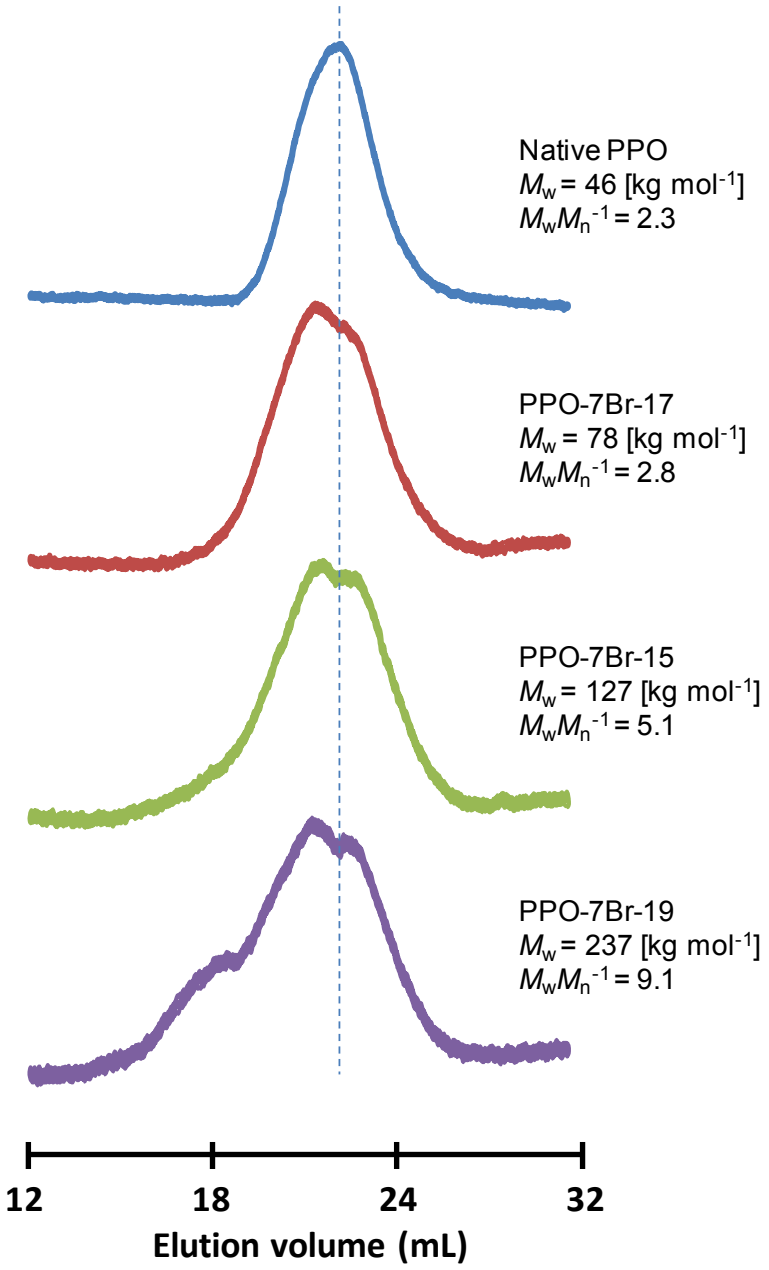

Figure S1. Typical SEC traces of native and bromoalkylated PPO, indicating increased M_n and PDI value by the appearance of high-molecular weight fractions after the bromoalkylation.

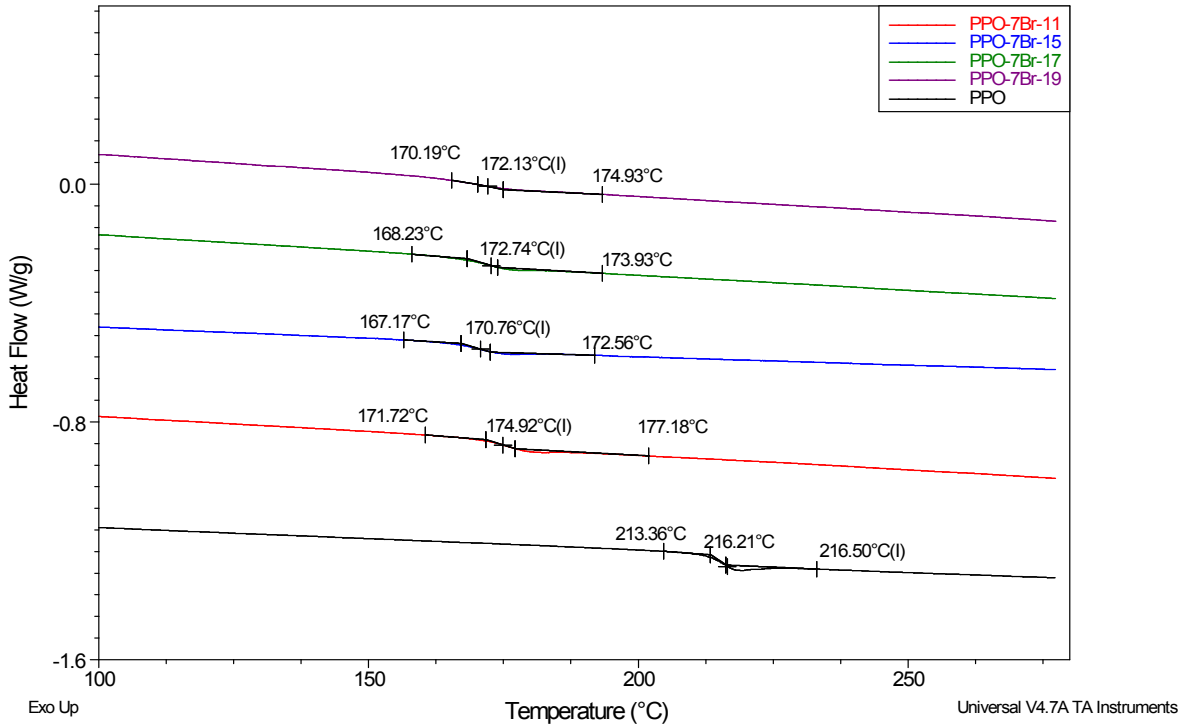

Figure S2. DSC heating traces of native and bromoalkylated PPOs (PPO-7Br-*DB*).

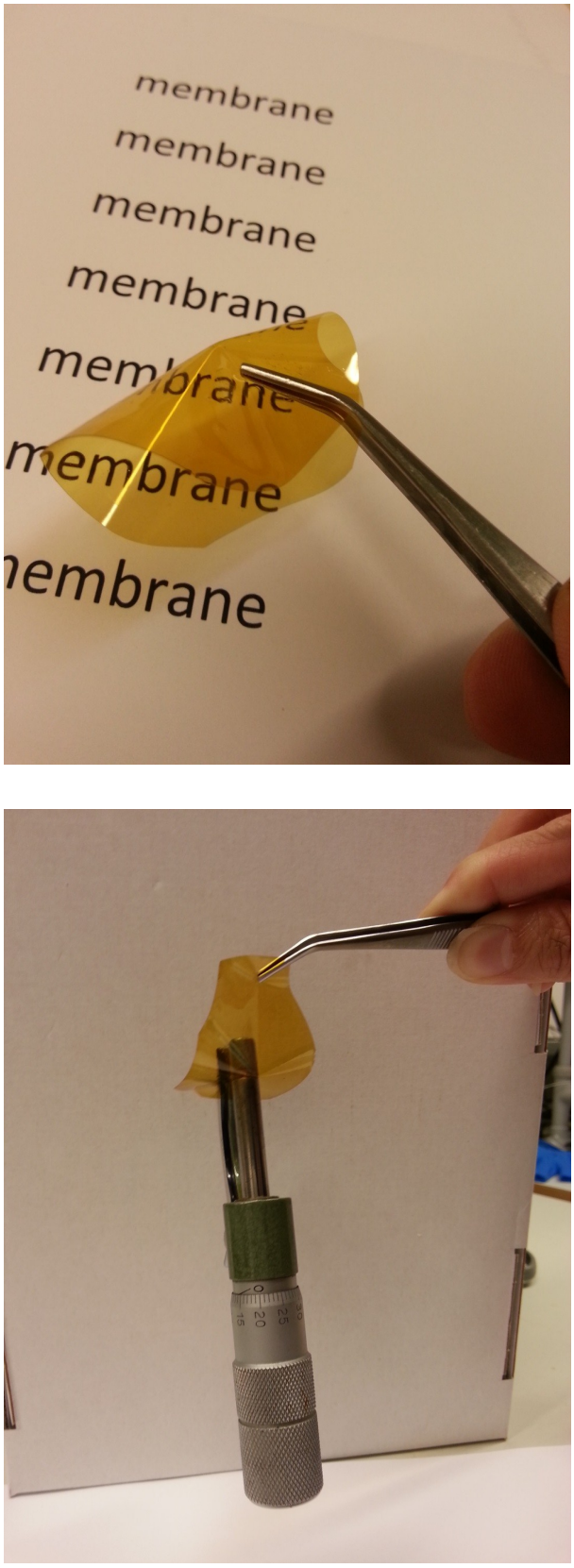

Figure S3. Photographs showing membrane PPO-7bisQPi-1.8Br in the 180° folded (upper) and load bearing (lower) state. The weight of the micrometer was 180 g and the membrane was seemingly unaffected after this treatment.

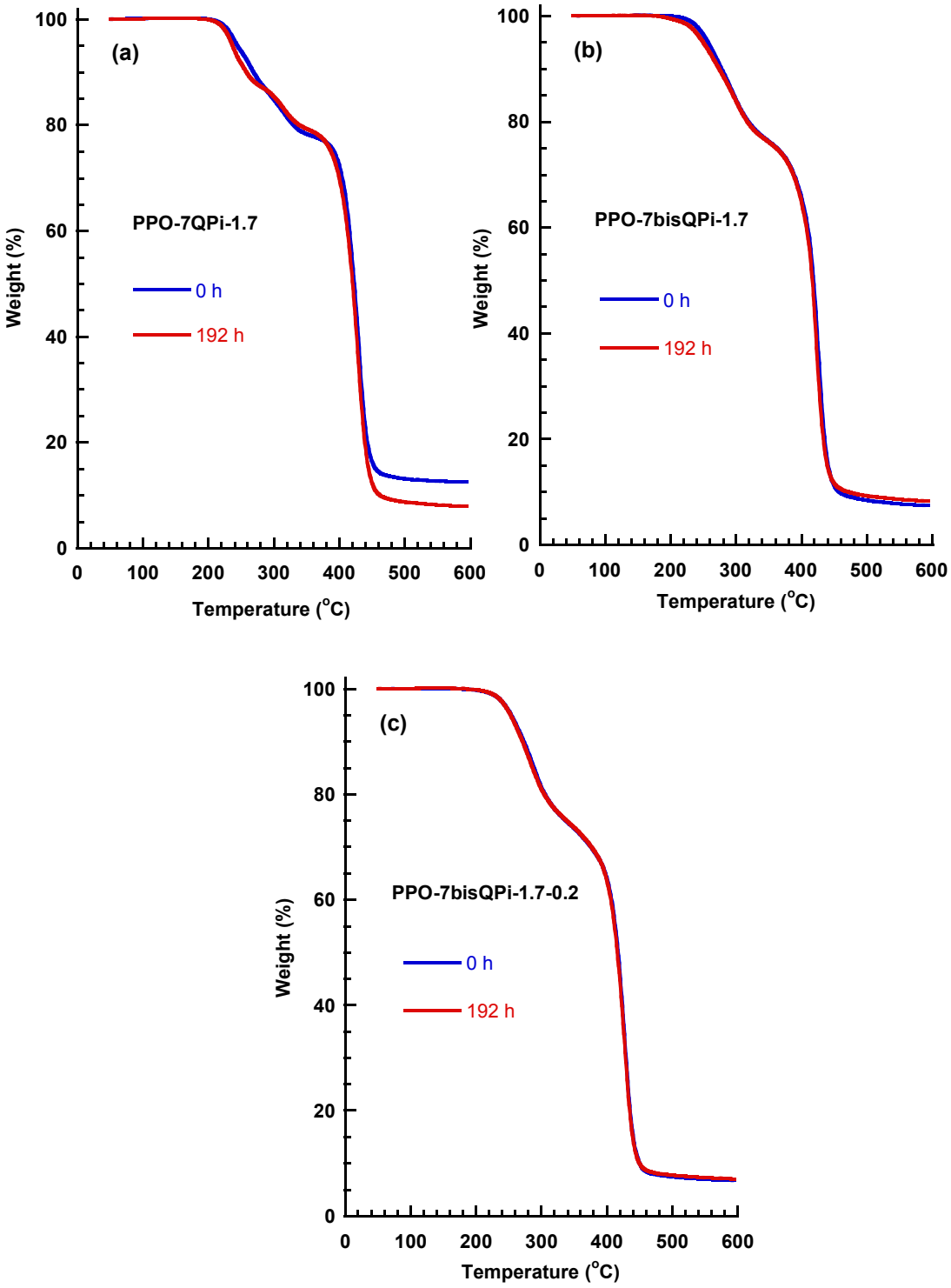

Figure S4. TGA traces of AEMs in the Br^- form before and after the alkaline treatment in 1 M NaOH at 90 °C for 192 h, (a) PPO with mono-QPi functional side chains, (b) PPO with bis-QPi functional side chains, and (c) crosslinked bis-QPi functional PPO (please note the high degree of overlap).

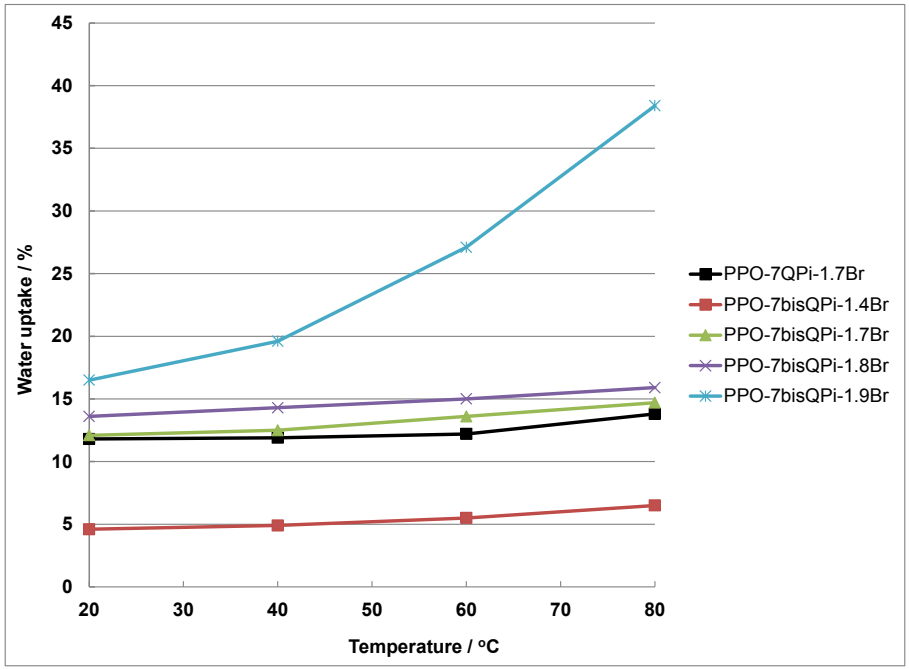

Figure S5. Water uptake of the fully hydrated (immersed) AEMs in the Br^- form as a function of temperature.

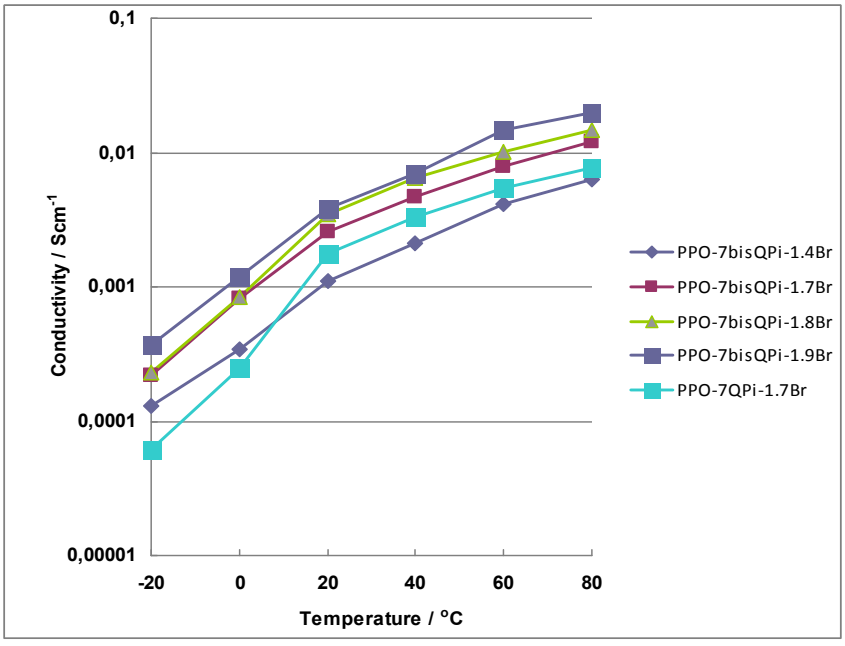

Figure S6. Br^- conductivity data measured by EIS of mono- and bis-QPi functionalized PPO AEMs under fully hydrated (immersed) conditions.

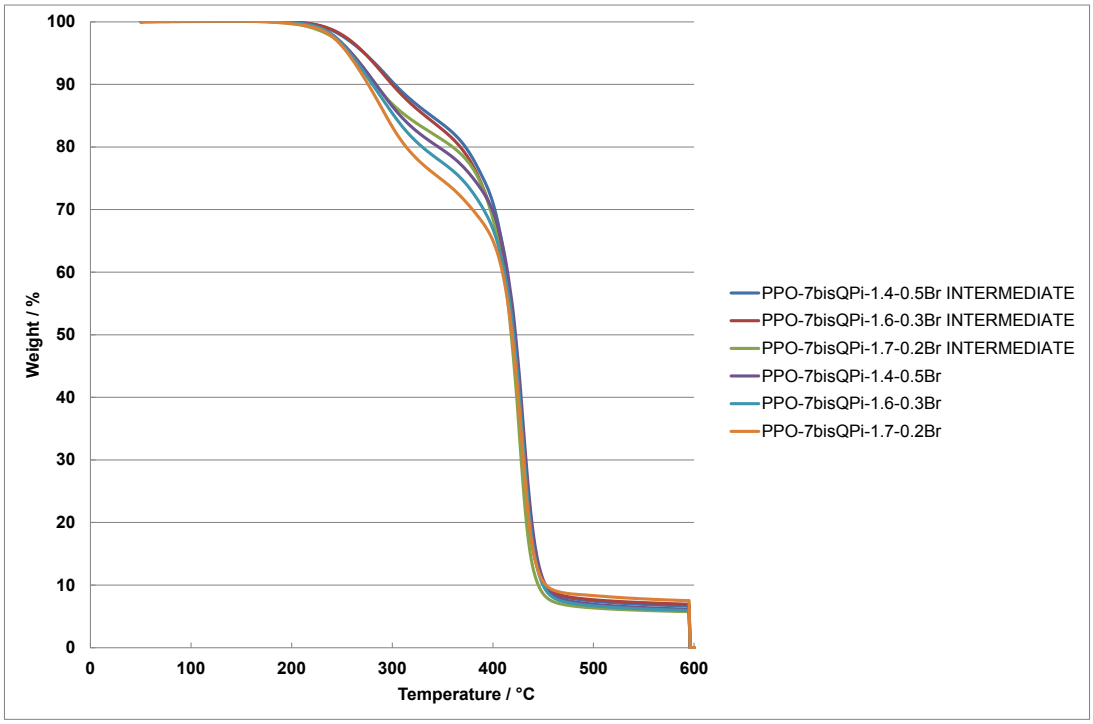

Figure S7. TGA traces of crosslinked AEMs based on PPO-7Br-20 after the first step (denoted "intermediate") and of the final PPO-7QPi-*x*-*y* membranes after the second (final) step. Samples measured under N_2 at 10 °C min^{-1} in the Br^- form.

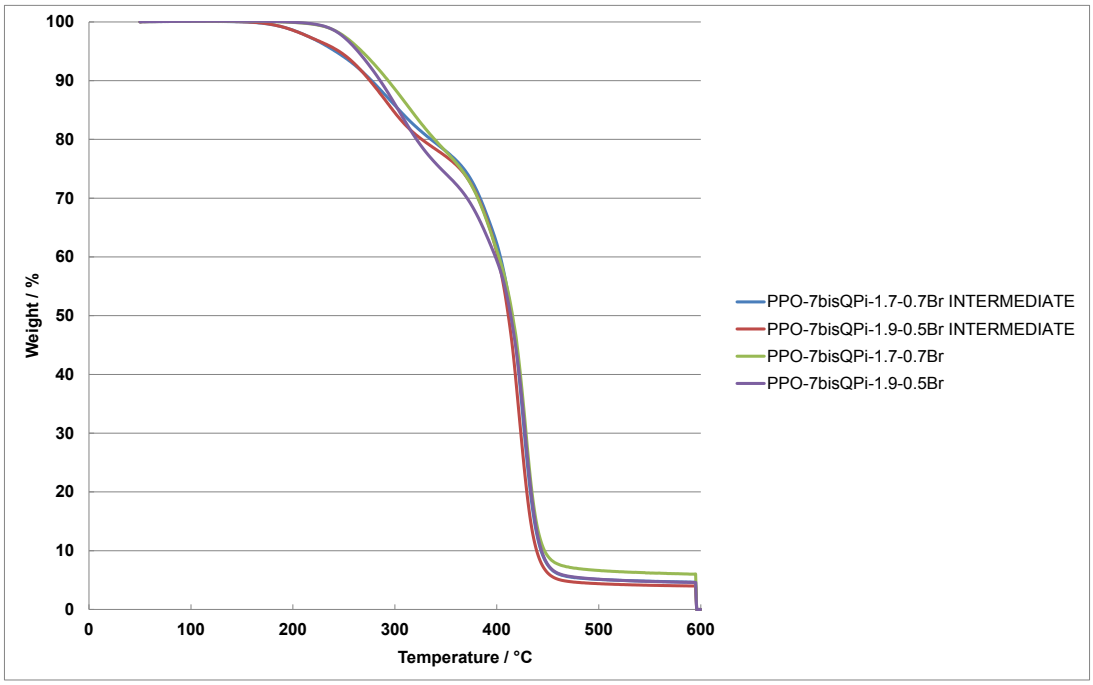

Figure S8. TGA traces of crosslinked AEMs based on PPO-7Br-30 after the first step (denoted "intermediate") and of the final PPO-7QPi-*x*-*y* membranes after the second (final) step. Samples measured under N_2 at 10 °C min^{-1} in the Br^- form.