

Novel mixed alkyl/aryl anion-exchange membranes for
electrochemical applications

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In this contribution we report on R&D of the synthesis and characterization of novel mixed aryl/alkyl anion-exchange membranes for fuel cell and electrolysis applications.

The core structure of the new anion-exchange membranes was built up by reaction of dihalogenoalkanes with tertiary diamines under formation of quaternized anion-exchange macromolecules. The basic polymers differs from aromatic polymeric sulfinates and/or a polymer containing tertiary basic N groups such as poly(4-vinylpyridine) or self-synthesized polymers containing pyridine or tertiary amino functional groups and/or polymers comprising halomethyl groups such as bromomethylated PPO. Some of the polymers have also been embedded in an inert polymer structure such as PVDF.

Membranes with ionic and/or covalent crosslinks have been synthesized, showing good chemical and mechanical stability and good performance in direct methanol fuel cells (DMFC) with use of Pt-free electrodes, as will be presented in this contribution.