Synthesis and properties of poly(arylene ether sulfone) with amine pendant groups on AEMs for alkaline water electrolysis

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Alkaline water electrolysis can overcome the limitation of proton exchange membrane (PEM) water electrolysis. And so anion exchange membranes(AEMs) need higher chemical, thermal stability, and mechanical strength for maintaining durability in alkaline water electrolysis. In this work, we synthesized a Poly(arylene ether sulfone) based electrolyte which contains the pendant amine group on the side chain for application in AEMs. The resulting polymers were quaternarized by TMA, TEA, and imidazolium and alkalizated by KOH solution for comparing the ion conductivity and Ion exchange capacity (IEC). Mechanical properties of membranes also was measured by Universal testing machines (UTM) and compared depending on amine-functional groups.