Anion exchange membrane based on alkali doped poly(2,5-benzimidazole) for alkaline membrane fuel cell

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Alkaline membrane fuel cell (AMFC) has been received increasing attention among the different types of fuel cells. Ammonium quaternized polymers such as poly (arylene ether sulfones) are being developed and studied as candidates of ionomeric materials for AMFCs, due to their low cost and promising electrochemical properties.

However, the performance of AMFC based on this type of membrane is still low due to easy degradation in alkaline medium at temperatures above 60 °C [1-3]. Nevertheless, the development of anion exchange membranes for AMFC is still in the early stage. It is still required to develop the anion exchange membranes for an improved performance of AMFC [4].

For the first time, an anion exchange membrane based on alkali doped ABPBI was prepared. The alkali doped poly(2,5-benzimidazole) membrane is a promising candidate as anion exchange membrane for fuel cell application. The alkali doped poly(2,5-benzimidazole) membrane reached an anion conductivity of 2.3×10^{-2} S cm^{-1} at room temperature. The alkali doped poly(2,5-benzimidazole) membrane showed excellent anion conductive stability in the alkali media up to 100 °C and high thermal stability comparing with membranes based on quaternized polymers.

References

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