Phosphoric acid doped polysulfone membranes with aminopyridine pendant groups and imidazole cross-links

Udel polysulfone based membranes with 4-aminopyridine pendant groups and cross-linking imidazole units are synthesized in a simple two step reaction. The ratio of 4-aminopyridine and imidazole is varied and the materials are extensively characterized. The average phosphoric acid uptake (in 85 wt% PA) ranges between 90 wt% and 452 wt% depending on the ratio of 4-aminopyridine and imidazole and the membranes show good proton conductivity of up to 65 mS cm\(^{-1}\) at 160 °C under non-humidified conditions. The applicability of these materials as a polymer electrolyte membrane was proven by single cell tests at 130 °C. The relationships between PA uptake, chemical composition and mechanical stability are reported. Proton conductivity and mechanical properties only depend on the phosphoric acid content, which, however is a function of the chemical composition.

General information
Publication status: Published
Organisations: Department of Energy Conversion and Storage, Fundamental Electrochemistry, Proton conductors, Korea Institute of Science and Technology
Contributors: Hink, S., Elsøe, K., Cleemann, L. N., Henkensmeier, D., Jang, J. H., Kim, H. J., Han, J., Nam, S. W., Li, Q.
Number of pages: 12
Pages: 102-113
Publication date: 2015
Peer-reviewed: Yes

Publication information
Journal: European Polymer Journal
Volume: 72
ISSN (Print): 0014-3057
Ratings:
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.58 SJR 1.022 SNIP 1.328
Web of Science (2015): Indexed yes
Original language: English
Keywords: High temperature polymer electrolyte membrane fuel cell (HT-PEMFC), Udel polysulfone, Aminopyridine
DOIs:
10.1016/j.eurpolymj.2015.08.026
Source: FindIt
Source-ID: 2281149992
Research output: Contribution to journal › Journal article – Annual report year: 2015 › Research › peer-review