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Polymer Membranes for Energy Applications

Guest Editor:

Dr. Jong Yeob Jeon
Department of Chemistry & Chemical Biology, Rensselaer Polytechnic Institute, Troy, NY 12180, USA

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Message from the Guest Editor

Polymer electrolyte membranes (PEMs) are key components of electrochemical energy conversion technology such as fuel cells, electrolyzers, and flow batteries. Although Dupont's Nafion™ dominates the PEM research field, it has drawbacks in terms of high material cost and the lack of synthesis versatility. Since each application has different requirements of its membrane, appropriate molecular design to harness specific properties is important in the development of PEMs. To address the issues, various hydrocarbon-based proton exchange membranes have been suggested. The performance and cost of membranes can be tuned by changing the molecular structures and their methods of synthesis. Recently, anion exchange membranes have gained much attention as electrochemical devices operating in alkaline conditions. Alkaline operating conditions allow for non-precious metal catalysts and less expensive cell hardware to be used instead of expensive platinum group metal catalysts and acid-resistant cell hardware, respectively.

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Editor-in-Chief

Prof. Dr. Alexander Böker
Lehrstuhl für Polymermaterialien und Polymertechnologie, University of Potsdam, 14476 Potsdam-Golm, Germany

Message from the Editor-in-Chief

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Contact Us

Polymers Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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