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# Influence of morphology on physical properties of poly(2,5-benzimidazole) membranes.

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## Abstract

In this work, the structural properties of pristine and phosphoric acid doped poly(2,5-benzimidazole) membranes have been investigated by small angle neutron- and X-ray scattering, X-ray diffraction, polarized light microscopy and transmission electron microscopy. The results of our investigation demonstrate formation of crystalline regions with a fractal-like distribution upon aging on length scales ranging from sub-nm up to some micrometers. Transport properties of phosphoric acid doped poly(2,5-benzimidazole) membrane measured by pulsed-field-gradient nuclear magnetic resonance spectroscopy reveal proton self-diffusion coefficients of the system.

*Keywords:* Polymer electrolyte membrane (PEM), high temperature PEM fuel cells, membrane structure and proton transport, fractal dimension, phosphoric acid (PA) doped poly(2,5-benzimidazole) (ABPBI)

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