

22nd International Conference on

ADVANCED MATERIALS AND NANOTECHNOLOGY

September 19-21, 2018 Tokyo, Japan

Novel polymer electrolyte membrane which proton conductive channel being constructed by core-shell type hybridized silica nanofillers**Keiji Shito¹, Yuki Takahashi¹, Satoshi Sekine¹, Tomohiro Nohara¹, Kazuki Koseki¹, Keisuke Tabata¹, Akito Masuhara¹, Philipp Vana², Wentao Peng² and Tohihiko Arita³**¹Yamagata University, Japan²University of Gottingen, Germany³Tohoku University, Japan

Polymer Electrolyte Fuel Cell (PEFC) is promising energy generating system because of their high energy conversion efficiency, low temperature operation and compact cell design. We designed a novel Polymer Electrolyte Membrane (PEM) for PEFC using inexpensive materials and fabricating precise nanostructures. We have focused on general inorganic filler filling method, which has advantage on improvement of heat resistance and gas barrier properties of the membrane. The structure of designed novel PEM composed of 2D oriented proton conductive polymer and spherical silica Nano Particles (NPs). Our PEM consists of silica NPs with proton conductive polymer layer prepared by Reversible Addition-Fragmentation chain Transfer Polymerization with Particles (RAFT PwP) on its surface. RAFT PwP can prepare precisely adsorbed hydrophilic polymer layer on particles surface, 2D ion conductive channel consists of weak acids can be effectively prepared. As a primary examination, proton conductive polymer was selected as inexpensive polymers with easy handling to examine our model.

Biography

Keiji Shito has completed his Master's degree from Yamagata University and PhD from Graduate School of Science and Engineering, Yamagata University. He is serving as a Research Fellowship for Young Scientists at the Japan Society for the Promotion of Science (JSPS).

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