

A new concept for polymer electrolyte membranes (PEMs) for PEFC

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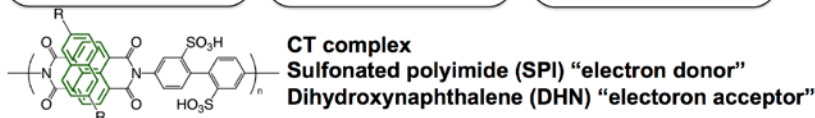
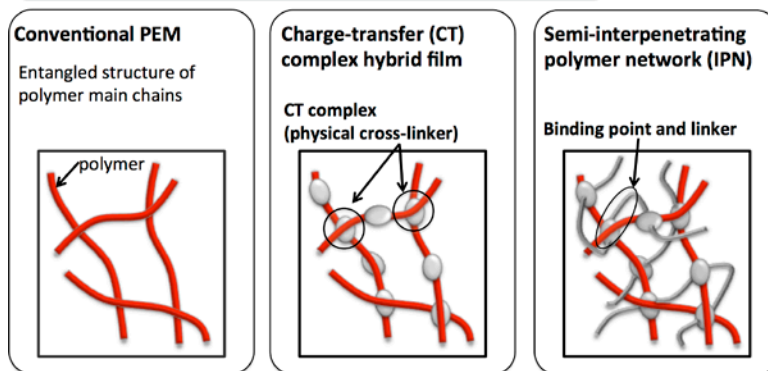
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Improvement of functions of polymer electrolyte membranes (PEMs) such as durability against temperature has been strongly required for practical usage of PEFC. In order to solve this requirement as easy as possible, we have been developing new type of PEMs from a different point of view. We have developed the film preparation method which has applied charge-transfer (CT) complex formation¹. To apply this film preparation method to PEM preparation, we used sulfonated polyimides (SPIs), which are well known as common PEMs. SPI consists of electron-accepting NDI units in the main chain and dihydroxynaphthalene (DHN) derivatives were used as an electron-donating molecule. Proton conductivity of the obtained CT complex hybrid films has been evaluated.

To further improve the film strength and durability, we have prepared semi-interpenetrating polymer network (IPN) films as PEMs. The obtained semi-IPN films have

New PEMs prepared by using simple methods



also investigated as new type of PEMs, and properties of PEM's have been evaluated by measurement of proton conductivity.

¹ R. Watari, M. Nishihara, H. Tajiri, H. Otsuka, A. Takahara, "Preparation of novel polyimide hybrid materials by multi-layered charge-transfer complex formation", *Polymer Journal*, accepted.