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**Effect of Coupled Catalyst Loading and Ionomer Binder on Oxygen Reduction Reaction in High-Temperature Pemfc**

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**EXTENDED ABSTRACT**

Polybenzimidazole (PBI) was studied as an ionomer binder at varying ratios (1-7) in a 20~40 wt% Pt-Pd/C cathode-coupled catalyst layer for the oxygen reduction reaction (ORR) in a high-temperature proton exchange membrane fuel cell (HT-PEMFC). Catalytic activity was examined by CV and LSV, while the properties of the catalysts were characterized by FESEM-EDX, N<sub>2</sub> adsorption-desorption, XRD and FTIR. The results showed that the distribution of metals on the carbon surface, carbon wall thickness and the interaction between ionomer and coupled catalysts affected the ORR performance. The fabricated membrane electrode assembly with 5:95 PBI: 30 wt% Pt-Pd/C catalyst ratio exhibited the best performance and highest durability for HT-PEMFC at 170°C, yielding a power density of 1.20 Wcm<sup>-2</sup> with 0.02 mgPt/cm Pt loading. This result was comparable to those reported by other studies [1-4], highlighting a promising catalyst for fuel cell application.

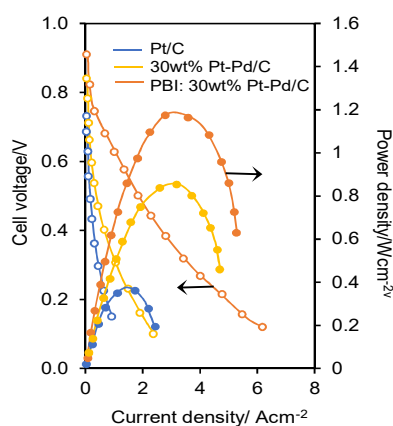


Fig. 1: H<sub>2</sub>/O<sub>2</sub> performance of single stack fuel cell for electrocatalyst

Keywords: Pt-Pd/C catalyst; polybenzimidazole ionomer; oxygen reduction reaction; high temperature-PEMFC

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