

## ORR Activity and Stability of Pt-Based Electrocatalysts in PEM Fuel Cell

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**Abstract :** A comparison of activity and stability of the as-formed Pt/C, Pt-Co, and Pt-Pd/C electrocatalysts, prepared by a combined approach of impregnation and seeding, was performed. According to the activity test in a single proton exchange membrane (PEM) fuel cell, the oxygen reduction reaction (ORR) activity of the Pt-M/C electro catalyst was slightly lower than that of Pt/C. The  $j_{0.9\text{ V}}$  and  $E_{10\text{ mA/cm}^2}$  of the as-prepared electrocatalysts increased in the order of Pt/C>Pt-Co/C>Pt-Pd/C. However, in the medium-to-high current density region, Pt-Pd/C exhibited the best performance. With regard to their stability in a 0.5 M H<sub>2</sub>SO<sub>4</sub> electrolyte solution, the electro chemical surface area decreased as the number of rounds of repetitive potential cycling increased due to the dissolution of the metals within the catalyst structure. For long-term measurement, Pt-Pd/C was the most stable than the other three electrocatalysts.

**Keywords :** ORR activity, stability, Pt-based electrocatalysts, PEM fuel cell

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