

### Investigation of Palladium-based Electrocatalysts for Oxygen Reduction Reaction

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PEMFCs (Polymer Electrolyte Membrane Fuel Cells) can be operated in lower temperature range compared to those of the different types of fuel cell. Such a low temperature range permits a faster start-up of the system and therefore it could be applied for the use in the automobile. Although PEMFCs have some advantages, there remain yet several problems preventing their commercialization. Among them, the high price of platinum in the MEA (Membrane electrode assembly) is a serious one, and then development of novel catalyst consisted of cheap elements should be needed. On the other hand, palladium-based catalyst has been extensively investigating to replace the platinum catalyst in the fuel cell. Palladium alloyed with transition metals such as Co, Cu, Ni, and Fe is the well-known active catalysts for oxygen reduction reaction (ORR). In this work, therefore, Pd alloys are designed and evaluated in terms of ORR activity.