

### Pt/PPy/Nafion composite electrode fabrication for PEM fuel cell by electro-deposition

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The proton exchange membrane fuel cell (PEMFC) has high current density per volume, and no corrosion problems. Also it can be operated at low temperature. It requires, however, a high initial investment cost due to the expensive noble metal catalyst and the electrolyte membrane. Many studies have been directed towards the development of an electrode with excellent performance at a low platinum loading.

Electro-deposition has many advantages in terms of controlled particle size, strong adhesion, And it is effective to enlarge the surface area by reducing the size of catalyst particles and to distribute the catalyst only on the surface of the nafion for a low platinum loading. Conducting polymer Polypyrrole is impregnated to distribute pt catalysts on the nafion which isn't a conductor of electricity. PPy has a good conductivity, electric stability and easy polymerization. At present, PPy is one of the most studied conducting polymer. PPy is impregnated on the surface of the nafion by chemical oxidation. Surfactants are added to expand reaction area between pt catalysts and PPy/Na.