

## Electrocatalytic Activity and Durability of Pt loaded Nb-doped TiO<sub>2</sub> Nanocatalyst

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ORR is one of the most important electrochemical reactions, which occurs in the cathodic compartment of fuel cells. To improve the catalytic activity and durability, stable oxide supports have been adopted. Among them, TiO<sub>2</sub> has attracted consideration as a novel support material due to its stability in fuel cell operation condition. Doping Nb dopant whose atomic radius is similar to that of Ti can increase the electrical conductivity of TiO<sub>2</sub>. In this study, we synthesized TiO<sub>2</sub> nanotube(NT) using the hydrothermal process, which is the 1D structure of TiO<sub>2</sub> suitable for a catalyst support due to the high surface area. Doping Nb into the TiO<sub>2</sub> NT leads to increase in electrical conductivity with doping level of up to 25at%. Pt nanoparticles can be loaded up to 20wt% on the Nb-TiO<sub>2</sub> NT. The electrochemical analysis was performed in three-electrode cell. The electrocatalytic activity and durability of the synthesized nanocatalysts were compared with Pt/C during an AST. In this study, we identified the optimal loading amount of Pt nanoparticles on the support catalyst, which results in the high corrosion resistance of Nb-TiO<sub>2</sub> as well as the strong interaction between Pt and Nb-TiO<sub>2</sub>.