

## Computational Analysis of Platinum Electrode in Proton Exchange Membrane Fuel Cells based on Flooded Agglomerate Model

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This paper reports further studies of platinum catalyst layers of proton exchange membrane fuel cells to understand and investigate the effects on key factors, which governs the cell polarization. In this study, a two-dimensional, two-phase, non-isothermal model for the analysis of the mass, charge, and energy transfer inside proton exchange membrane fuel cell was developed using finite volume method. The model was validated with experimental data sets taken from literatures. Using the validated model, analysis of key parameters, such as thickness of platinum electrode, platinum loadings, and Nafion loadings have been conducted to investigate influences on cell performance. Consequently, controlling these parameters crucially affects on catalyst activation and ohmic overpotentials, resulting in enhancement of cell performance.