

## Investigations on the carbon supported Pt nano catalysts preparation by polyol process for fuel cell applications

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Parametric investigation of polyol process for the preparation of carbon supported Pt nano particles as catalysts for fuel cells was carried out. It is found that the concentration of glycolate anion which is the function of pH plays an important role in controlling Pt particle size and Pt loading on carbon. It was observed that with increasing alkalinity of the solution, poor adsorption or repulsive forces results in lower Pt loadings. Zeta potential measurements showed that it was mainly due to the decreased forces of attraction between the colloids and the support. As a modification to the conventional polyol process, the effect of typical gas purging conditions on the characteristics of Pt/C was reported. By optimization of gas environment during the reaction, it is possible to obtain high loading of 39.5wt% with a 2.5nm particle size of Pt/C. From the single cell test, it showed that operating on ambient O<sub>2</sub> at 70°C can deliver high performance of more than 0.6 V at 1.2 A/cm<sup>2</sup>.