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**Electrocatalytic Electrooxidation of Methanol on a Pt/Au/polymer(Tyrasol)-carbon nanotube Modified Glassy Carbon Electrode**

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**Abstract:** The direct methanol fuel cell (DMFC) is one of the most promising energy sources for the future [1-2]. The burgeoning demand for clean and energy-efficient fuel cell systems requires electrocatalysts to deliver a greater activity and also selectivity. Pt-based electrocatalysts in DMFCs, have shown high activity for methanol electrooxidation reactions at anode of a fuell cell. However, pure Pt at anode is easily poisoned by carbon monoxide (CO) [3]. Therefore, many attempts have been made to overcome these problems and to develop less expensive anodic materials, which have significantly better catalytic activity and are less prone to CO poisoning. In this research work, a direct methanol fuel cell using a glassy carbon electrode (GC)

modified with Pt nanoparticle ̧ Au nanoparticle, polymer (Tyrasol) and also carbon nanotube (CNT) was constructed as an anode in a fuell cell.The Au and Pt nanoparticles were deposited on the surface of the

electrode using chronoamperometric technique, also the polymer layer with cyclic voltammetry (CV) technique. The characterization and the performance of the electrode were studied by scanning electron microscopy (SEM), electrochemical impedance spectroscopy (EIS) and CV. Moreover, the effects of various parameters such as methanol concentration, thickness of polymer layer and the amount of the Pt and Au nanoparticles on the electrooxidation of methanol molecules were investigated. The results show that the Pt/Au/polymer-CNT catalysts show a high electrocatalytic activity towards the methanol electrooxidation reaction as compared to Pt catalyst .Therefore, the fabricated modified glassy carbon electrode, can be used as a suitable anode for electrooxidation of methanol molecules in direct fuell cells.

**Keywords:** Electrooxidation of methanol; modified electrude; Pt/Au/polymer-CNT; Fuell cell

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