



## The study of synergism effect in physical mixture of Gold and platinum electro catalyst for glucose oxidation reaction

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### Abstract

Glucose as monosaccharides in nature, there are plenty. The complete oxidation of glucose produce a lot of energy (2.87 106 J/mole). To obtain useful energy from glucose oxidation, direct conversion of chemical energy to electrical energy is the best solution. For this purpose an electrochemical cell can be used. For oxidation of glucose in anode of cell, the electro catalyst must be used. Some of noble elements can be applied as an electro catalyst. In this work, the effect of platinum electro catalyst at presence of gold particles for glucose oxidation reaction was investigated. For this purpose, after preparation of platinum and gold on carbon electro catalysts, Au/C - Pt/C mixtures at various percent (20:80, 40:60, 50:50, 60:40, and 80:20) were used for fabrication of gas diffusion electrode. The total amount of electro catalyst in the reaction layer was 3 mg/cm<sup>2</sup>. A three-electrode half-cell apparatus was used for evaluation of prepared electrodes for glucose oxidation reaction. The electro catalytic performance of the electrode was investigated by electrochemical Impedance Spectroscopy (E.I.S) and Linear Sweep Voltammetry (L.S.V). It was shown, the amount of gold in the reaction layer of gas diffusion electrode influences on electro oxidation kinetics of glucose. In the optimized condition, the amount of gold in the reaction layer was 20 percent. It will be discussed more in this paper.

**Keywords:** Glucose, fuel cell, Electro-Oxidation, Platinum, electro catalyst

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