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**Title:** The investigation of Electron transfer mechanism of glucose oxidase at graphene and graphene oxide electrode

**Authors:** Khadijeh Eskandari, Sina Sabory, Mostafa Amoozadeh, Farhad Sharif

**Abstract:** Graphene, a two dimensional sheet of sp2 conjugated atomic carbon, has intense interest researching for unique properties such as high conductivity, ultrahigh carrier mobility and low cast. Graphene was used in many technologies such as sensors, solar batteries, super-capacitors, hydrogen storage and nanocomposite. Because graphene has a high conductivity, therefore it has many applications for electron transferring in redox protein study. In this work, graphene oxide was synthesis by chemical method, and then it was reduced to graphene. Graphene and graphene oxide was characterized by several spectroscopies, such as scanning microscope electron, infra red and UV-Vis spectroscopy. These data show that, graphene and graphene oxide was accessfully synthesis in nanometric scale. Also, the conductivity of graphene and graphene oxide was studied by electrochemical impedance spectroscopy. In next step, glucose oxidase was immobilized on graphene and graphene oxide by physical adsorption. The direct electron transfer of active site in glucose oxidase on graphene and graphene oxide was investigated by cyclic voltametry. Electrochemical impedance spectroscopy and cyclic voltametry show, the conductivity of graphene is high than graphene oxide. Thus, direct electron transferring of glucose oxidase on graphene is facile and its current is high, but glucose oxidase on graphene oxide not trasfer electron. Glucose oxidase reversibility on graphene is near to nernest potential. The formal potential of glucose oxidase is -240 mV in verses of Ag/ AgCl. Also, the thermodynamic and kinetic parameters such as electron transfer coefficient and electron transfer heterogeneity was extracted from different scan rate.

**Keywords:** glucose oxidase, graphene, electrochemistry

**Presentation:** Poster