Graphene has reached importance in the last decade. It has particular properties, such as Young’s module, semiconducting properties and high transparency, but more important its surface active reaching more than 2500 m$^2$/g. Oxidized graphene is a graphene sheet with hydroxyl, carbonyl and epoxy covalently attached groups. It has similar properties as graphene but it exhibits high hydrophilicity due to the polar groups in the structure. These properties makes graphene and oxidized graphene suitable for electrocatalysts support; specifically for oxygen reduction reaction (ORR), which takes place in PEM fuel cells. Graphene sheets were obtained through aqueous ultrasonic exfoliation using surfactants as stabilizers such as Sodium Dodecyl Sulfate (SDS) and Polyvinilpirrolidone (PVP). It was found that SDS showed better obtained by chemical oxidation and ultrasonic exfoliation. Both synthesis were carried out using an ultrasonic lance at 750 W at 20 kHz. The samples were characterized by Raman and FTIR spectroscopy. Raman spectra showed characteristic intensity in the D, G and G’ peaks of graphene and oxidized graphene. There were found through FTIR spectroscopy the characteristic bands corresponding to hydroxyl, and carbonyl groups in the oxidized graphene samples. Both, graphene and oxidized graphene were decorated with Ni and Pd nanoparticles by chemical reduction technique in aqueous solution. Finally, the supported electrocatalysts samples were evaluated by electrochemical tests in acid medium to determine the catalytic activity.

**Keywords:** GRAPHENE, ELECTROCATALYST, SODIUM DODECYL SULFATE

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