Nisrine Benzbiria et al., J Phys Chem Biophys 2017, 7:2(Suppl)
DOI: 10.4172/2161-0398-C1-019

Determination of the kinetic parameters of oxygen reduction on copper using a rotating disk electrode in neutral medium

Nisrine Benzbiria[1,2], Siham Echihi[1], Wafaa Qafsaoui[1], Mustapha Zertoubi[2] and **Mohamed Azzi[2]**
[1]University of Chouaib Doukkali, Morocco.
[2]University of Hassan, Morocco.

Regarding their excellent mechanical properties associated to a corrosion resistance quite satisfactory, the passivated metals occupy a prominent place in several industries. However, these materials undergo corrosion in some media especially those containing chloride. Consequently, to understand the phenomena taking place into their surface, some electrochemical investigations should be done. The majority of the previous studies concerned only anodic dissolution of the metal while the cathodic reaction, which is least studied, can provide relevant information. Oxygen reduction assumes importance in corrosion processes since in neutral solutions and in the absence of any other depolarizer the corrosion rate is controlled by the kinetics of oxygen reduction reaction. Our interest is to outline the significant role of oxygen reaction reduction (ORR) on copper. For this purpose, we have used the rotating disc electrode (RDE) to obtain cathodic polarization curves in neutral Na_2SO_4 solution containing different O_2 concentrations. Three types of copper surfaces were investigated: pre-reduced electrodes, copper pre-oxidized to Cu/Cu_2O and pre-oxidized to the duplex $Cu/Cu_2O/CuO$ layer. This will allow us to elucidate the influence of film and dissolved oxygen concentration on the kinetics of the cathodic reaction. Parameters, such as reaction order, kinetic current, Tafel slopes as well as the number of electrons transferred are determined.

Biography

Nisrine BENZBIRIA is a PhD student currently attending Faculty of Sciences of El Jadida at Chouaib Doukkali University, with a joint supervision in Faculty of Sciences of Casablanca at Hassan II University. Her current research project takes part in the study of the kinetic parameters of oxygen reduction reaction on copper and aluminium, which are widely used in aeronautical industry. Prior to her doctoral studies, she received her engineering degree in materials from Cadi Ayyad University in 2012. Then, she worked as a head of slip casting Department in Casablanca.

nisrine.benzbiria@gmail.com

Notes: