**Model Development of the Adsorption of Some Cations on Manganese Dioxide (MnO2) Used in A Lechlanche Dry Cell**

**Abstract**

The study was aimed at developing a mathematical model for the adsorption of cations (Zn2+and Pb2+) on MnO2 used in dry cell and to stimulate the processes. The model equations were developed to predict the adsorption capacity of cations, on the MnO2. The data used were from previous experimental work. Polymath 5.1 and Q-Basic software programme used in statistical analysis of the model result. The model equations obtained and their corresponding multiple square regression calculated at 35°C for Zn2+: q = -4.925e-6 - 2.146e-6∙X1 + 5.782e-7∙X2 + 3.291e-7(X1∙X2­) - with R2 = 0.887, and Pb2+ respectively: q = -4.693e-6 - 5.013e-4∙X1 + 4.471e-7∙X2 + 4.889e-5(X1∙X2­) - R2 = 0.973 and at 45°C for Zn2+: q = -6.445e-6 - 3.752e-6∙X1 + 7.298e-7∙X2 + 4.719e-7(X1∙X2­) with R2 = 0.714, and Pb2+ respectively: q = -1.764e-5 - 7.044e-5∙X1 + 1.654e-6∙X2 - 9.778e-6(X1∙X2­) with R2 = 0.711.The adsorption of Zn2+ was fond to be higher over that of Pb2+ at 35°C with interaction of species at the lowest concentration of the electrolytes at the highest pH value considered or investigated.