



STUDIES ON THE PROCESS OF NITRATES CONTENT DECREASING IN SIMULATED SOLUTIONS DURING ELECTROCHEMICAL TREATMENT

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Abstract

We have studied the process of electrochemical reduction of nitrates that was observed during the treatment of simulated solutions and of natural waters within the cell with soluble aluminum anodes, depending on the initial concentration of the nitrates, the quantity of electricity, the intensity of the electrical current and the value of pH.

It has been established that during the electrochemical treatment of the simulated solution that contain nitrates: the concentration of the nitrates from the cell with soluble anodes of aluminum reduces, if the quantity of electricity increases. The effect of the nitrates' reduction is almost the same, at the intensity of 1A and 3A, but the time of treatment is different. The time of treatment decreases when the intensity of the electrical current increases (while the quantity of electricity is the same).

Based on the obtained result, we calculated the rate constant of the reduction reaction the half time and the total time of treatment of the simulated solutions up to the admitted residual concentration, foreseen for the nitrates of the drinking water.

It has been found that the total time for the reduction depends on the initial concentration of the nitrates and this very time increases together with the initial concentration, but the specific expenses of energy used to remove 1g of nitrates decreases.

It was established that the effect of reduction of the nitrates at the electrochemical treatment of the simulated solutions and the natural waters greatly depends on the value of pH. When the value of the pH decreases, the above-mentioned effect increases up to 60%. In order to achieve the experiment, it is recommended that the initial value of the waters subdued to the electrochemical treatment should be between 3,75 – 4,00 units of pH.

Keywords: nitrates, electrochemistry, reduction, soluble anode

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