

QUANTITATIVE DETERMINATION OF POTASSIUM HYDROGENPEROXOMONOSULFATE BY VOLTAMMETRY IN THE PRESENCE OF SODIUM DODECYLBENZENESULFONATE

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Many disinfectants consist of surface-active substances (SAS), which provide contact with pathogens oxidant, react with membrane lipids and proteins causing denaturation of the cell membranes. It is known that disinfectant Ecocide S except active substance potassium hydrogenperoxomonosulfate (PMS) contains surfactant sodium dodecylbenzenesulfonate (SDBS).

The aim of the research was to develop a procedure of quantitative determination of PMS in the presence of SDBS by cathodic voltammetry by the method of calibration graph. Electrochemical measurements were carried out in the analyzer ABC-1.1 (Volta, St. Petersburg) with a three-electrode scheme by alternating current mode with square wave modulation in the potential range +1.0...-1.2V, $W=1000\text{rpm}$, amplitude 40mV, $\nu=65\text{Hz}$. Carbo-sil electrode (CE) was used as a working and an auxiliary electrode, and Ag,AgCl/KCl(sat) electrode type EVL-1M4 as a reference electrode on the background of $0.2\text{ mol L}^{-1}\text{ KHSO}_4$ ($\text{pH}\approx 2$). It was experimentally proved that SDBS leads to an increase of the current peak and the peak potential shifts to more electropositive side (+0.25 \rightarrow +0.3V). The current increase, probably due to relief desorption product recovery from the electrode surface, and the acceleration of electron transfer in the course of electrochemical reactions. The influence of the present SDBS was examined. The current peak increases with the concentration of surfactant up to $1.2\times 10^{-3}\text{ mol L}^{-1}$ and then stays almost constant with the increase in concentration of SDBS above $3.0\times 10^{-3}\text{ mol L}^{-1}$. A method calibration graph for quantitative determination of PMS in the presence of SDBS in disinfectant Ecocid S have been investigated. The linear dependence was observed in the PMS concentration range $(1.8-9.0)\times 10^{-5}\text{ mol L}^{-1}$, the calibration curve equation was $I_p = (4.3\pm 1,1)\times 10^4 c$ ($r=0.998$); RSD were 0.025...0.021 and $\delta = -0.64\text{...}+0.16\%$ respectively ($n=5$; $P=0,95\%$), $\text{LOD}=6.50\times 10^{-6}\text{ mol L}^{-1}$, $\text{LOQ}=2.17\times 10^{-5}\text{ mol L}^{-1}$.

Thus, new voltammetric method of PMS determination in the presence of SDBS using CE (glassy carbon) electrode as indicating electrode was developed and the possibility of its quantitative determination was shown.