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## Prospects of application of iron-containing carbon-paste electrode in electrochemical analysis

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The literature analysis devoted to the number of electrochemical sensors developed for metal ions is growing. This is due to the modification of already known classical electronic systems, or the use of new materials in the production of solid-phase, membrane, gas electrodes. One of these systems is a carbon-paste electrode, which belongs to the group of heterogeneous carbon electrodes. The ability to select an electrode-active substance for a specific research task is the main advantage of these electrochemical sensors. For example, an active electrode material was synthesized a polymer metal complex of lead(II) to determine lead ions in a solution [1]. The application of expensive reagents such as ethylene glycol dimethacrylate is the one of the disadvantages of them. Therefore, the purpose of the work was the identifying possibility of application an environmentally friendly natural material for modifying the carbon-paste electrode and determining iron ions in aqueous solutions. The active electrode material (iron-containing carbonized wool) was characterised by modern physical and chemical methods (scanning electron microscope (SEM), Fourier Transform Infrared Spectroscopy (FT-IR), thermal analysis (TG-DTA)).

The analytical characteristics of the iron(III)-containing electrode were also determined in the direct potentiometry mode:  $1.00 \cdot 10^{-4}$  mol/l was taken,  $9.20 \cdot 10^{-5}$  mol/l was found (n = 5, P=0.95, S<sub>x</sub>=4.74 \cdot 10^{-6}), relative error of the determination 8% and during potentiometric titration with a solution of ethylenediamintetraacetic acid in the presence of sulfuric acid (0.001 mol/l):  $\Delta E$ = 4.4 mV,  $1.0 \cdot 10^{-3}$  mol/l was taken,  $0.95 \cdot 10^{-3}$  mol/l was found, Sr=1.92 \cdot 10^{-5}, n=5, P=0.95, the relative error of the determination 0.2 %. Therefore the amount of iron (II) in aqueous solutions can be determined potentiometrically with a modified carbon-paste electrode.

## References

[1] T. Alizadeh, N. Hamidia, M. Reza Ganjali, F. Rafieia, J. Environmental Chemical Engineering. 5 (2017) 4327-4336.