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# Photometric determination of chromium(III) and iron(III) with using $Na_2EDTA$

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**Abstract**

The method of photometric determination in solutions of chromium(III) and iron(III) in a simultaneous presence has been developed. The method is intended for the analysis of iron and chromium-containing technical products. The method is based on differences in the electronic spectra of chromium(III) and iron(III) complexes with $Na_2EDTA$. The electronic spectra of complexes with chromium(III) have absorption maxima at 394 and 584 nm.The electronic spectra of complexes with iron(III) have an absorption maximum at 470 and a shoulders at 540-560 nm and at 240-280 nm. The wavelength of 315 nm was chosen to determine iron(III), since chromium cations do not interfere. The wavelength of 660 nm was used to determine chromium(III), since iron cations do not interfere. The optimal conditions for the reaction and the metrological characteristics of the method are determined. The complex of the iron cation is formed at the moment of mixing the solutions. The complexation of the chromium(III) cation occurs slowly at room temperature. Therefore, a photometric reaction with $Na_2EDTA$ is carried out in a boiling water bath for 5 minutes. The reaction mixture is then basified with ammonia water. Alkalization allows 2-3 times increase in absorption.

The calibration dependence for the determination of chromium(III) ions is direct (pair correlation 0.9999). To determine of iron(III), the calibration curve is parabole (Pair correlation 1). The accuracy of determining of chromium(III) and iron(III) ions is 99-104%. The results of the reaction are well repeated, the coefficient of variation does not exceed 1.4%.

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