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# Electrochemical Analysis of Magnesium Orotate Tautomers

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**Abstract.** The oxide-ruthenium electrode is used for the analysis of oxygen-containing biologically active organic substances. This electrode can be recommended for the analysis of formic acid in dilute solutions (no more than 2 ml in 100 ml of solution). Due to the presence of two display potentials, the reliability of the determination of formic acid in solution is quite high. For the determination of nitrogen-containing compounds (urea), oxide-ruthenium electrodes are unsuitable. The obvious differences in the polarization curves of magnesium orotate tautomers indicate that the structural differences of tautomers persist in aqueous solutions. An electrochemical method using a ruthenium oxide electrode can be recommended for the analysis of the isomeric state of organic compounds containing OH and COOH groups. The electrochemical method has clearly shown that the difference in the structural state of magnesium orotate tautomers persists in solutions.

## Introduction

Titanium oxide ruthenium (ORTA) the electrodes were created empirically. On their surface there are sufficiently stable thermodynamic and kinetic oxides of ruthenium ($RuO_2$) and platinum ($PtO_2$). Sometimes such electrodes are doped with titanium oxides( $TiO_2$), which increase the electrical conductivity due to n-conductivity [1-3]. In the electrochemical study of various processes, it is often necessary that the electrode material does not change (does not break down, does not dissolve, does not corrode, does not enter into chemical reactions).When studying corrosion, all polarization measurements are based on the fact that the electrode material is subjected to anodic dissolution, i.e. the current is equal to the corrosion rate. Often, electrodes are used that themselves do not change under the influence of current polarization, such electrodes are more often called - ideally polarized. Mercury (Hg) is used as a classical perfectly polarized electrode.

Ruthenium oxide electrodes are non-polarizable electrodes. If we take this electrode in a borate buffer solution from -1200 to +1200 W, then a very small current is recorded in the range of about 2000 MW. This indicates the absence of electrochemical processes. However, if electrochemically active substances are added to this solution, then features appear on the potentiodynamic curves as a result of the processes of recovery or oxidation of this substance. Depending on the nature of the substance, the signal potential is an electrochemical characteristic of this substance.

## Experimental

In this work, ORTA were used to analyze a number of biologically active substances, in the molecules of which there are nitrogen - and oxygen-containing functional groups.

Titanium oxide-ruthenium electrodes were manufactured in Institute of Mathematics, Information Technologies and Physics UdGU. The electrodes are mesh squares. Polarization