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Title of PhD dissertation: **Oxidation and reduction processes for 1,10-phenanthroline derivatives and their analogs**

Language of PhD dissertation: English

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**Supporting Supervision:** dr Romana Sokolova

**Keywords of PhD dissertation in English:** 1,10-phenanthroline, nucleophilic substitution, amination, reduction mechanism, oxidation mechanism, IR spectroelectrochemistry

**Summary of PhD dissertation in English:** The doctoral dissertation is divided into three parts: introduction, results, and discussion, and experimental. The introduction is divided into individual chapters in which the preparation, application and functionalization of 1,10-phenanthrolines are described, preparation and functionalization of quinoline derivatives, and electrochemical properties of selected *N*-heterocyclic compounds. The main part of the work is the results and discussion, which describes the effects of experiments in the field of syntheses of selected symmetrical and unsymmetrical 1,10-phenanthrolines, functionalization of selected 1,10-phenanthrolines, and oxidation and hydrolysis of selected 1,10-phenanthrolines. The results and discussion also present electrochemical tests in which the mechanisms of oxidation and reduction for the obtained compounds were proposed. Additionally, studies of the reaction of preparation and functionalization of quinoline derivatives and benzo[*h*]quinoline as well as VNS reactions for selected nitroquinoline derivatives, are presented. The experimental part includes procedures for the preparation of compounds, spectral analysis of products, and a list of instruments that were used in the implementation of this work.