

Abstract

The aim of this thesis is the study of electrochemical oxidation of *para*-substituted phenol derivatives using cyclic voltammetry (CV) and „direct current” voltammetry (DCV) on boron-doped diamond electrode (BDD) and comparison with some analogous *meta*-substituted compounds. Among the studied substances were *p*-cresol, 4-methoxyphenol, 4-hydroxybenzoic acid, 3-(4-hydroxyphenyl)propionic acid, 4-nitrophenol, 4-chlorophenol and 3-(trifluoromethyl)phenol. The oxidation of the analytes was performed in an acidic (pH 2,0) and basic (pH 11,0) Britton–Robinson buffer on mechanically polished, oxidated and hydrogenated surfaces. Another subject of the thesis is to analyze the influence of different substituents, characterized by the Hammett constant, on the oxidation potential of selected phenols. They are oxidized at more positive redox potentials in acidic media, than in basic media, where they are dissociated. The oxidation on the polished and hydrogenated surfaces were similar, whereas were shifted to higher values on the oxidated surface. Further, the signal intensity decreased on the oxidated one, and the oxidation of phenols was not recognizable in basic media. The passivation of the electrode was less significant in pH 2,0 buffer. The best result of Hammett correlation was achieved on a polished and hydrogenated surfaces in alkaline media.