

Abstract

This thesis is focused on the study of electrochemical oxidation of *meta*-substituted phenol derivatives on boron doped diamond electrode. Four different doped electrodes prepared at a gas phase B/C ratio of 500 ppm, 1000 ppm, 2000 ppm and 8000 ppm were used for the measurement. At first, five redox markers were measured, i.e. potassium hexacyanoferrate, hexaamintuthenium chloride, methyl viologene dichloride hydrate, N,N,N',N'-tetramethyl-p-phenylenediamine, and quinizarin. Then, phenol and its derivatives were observed by DCV „*direct current*“ voltametry; among the studied substituents were $-\text{CH}_3$, $-\text{OCH}_3$, $-(\text{CH}_2)_2\text{COOH}$, $-\text{COOH}$, $-\text{NO}_2$, $-\text{CF}_3$ and $-\text{Cl}$. The measurement was performed on anodic activated O-BDD surface. Two media for the measurement were selected, with pH 2 and pH 11. In the alkaline medium, the potential values of electrochemical oxidation were lower than in the acidic one. Phenolic acids did not provide any anodic signal in a basic solution and could not be detected. This is most likely due to electrostatic repulsion between the partially negative electrode surface and the acid anion. Finally a Hammett correlation was created for the studied phenol derivatives to assess the electronic effects of functional groups on the oxidation potential of individual phenols. Better correlation was achieved in the acidic solution.