

289s The Effect of Electrode Properties on Direct and Indirect Electrochemical Oxidation of Acetaldehyde

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The electrochemical oxidation of acetaldehyde on platinum electrodes has been published by several authors. For this application platinum and its alloys were mainly used due to their catalytic abilities. Besides the electrochemical oxidation to acetic acid, carbon monoxide is generated by cleaving the carbon bond of acetaldehyde in side reactions. Especially at platinum, carbon monoxide may poison the electrode and reduce the catalytic properties. With alternative electrode materials such as diamond coated electrodes this limitation can be avoided. In a first step the direct electrochemical oxidation of acetaldehyde on several electrode materials and electrolytes was investigated. The influence of electrolyte concentration and current density were point of view. Product selectivity and yield were recorded. In a second step indirect anodic oxidation by using a redox mediator was the main focus of investigations. To raise product selectivity and current efficiency redox mediator was added to the anolyte. The influence of mediator concentration and current density was again investigated by recording yield and product selectivity.