

表面与界面工程

## 铬酸酐电合成过程中工作电压的变化

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收稿日期 2005-7-25 修回日期 2005-10-9 网络版发布日期 2006-3-3 接受日期

摘要

关键词 [铬酸酐](#) [电化学合成](#) [工作电压](#) [模型](#)

分类号

## Change of operating voltages in electrosynthesis process of chromic anhydride

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### Abstract

A new green technology of producing chromic anhydride with an electrochemical synthesis method was studied to solve the pollution problems in the traditional production process of chromic anhydride. A self-made electrosynthesis reactor of pure titanium and stainless steel, with a multiple-unit metal oxides combination anode, a cathode of stainless steel, and a reinforced combination cation exchange membrane with perfluorosulfonic and perfluorocarboxylic polymers was used to carry out, the direct electrochemical synthesis experiment of chromic anhydride from sodium dichromate. From the experimental results and the principle of electrochemical reaction, it was found that the process of electrochemical synthesis reaction of chromic anhydride might be quantitatively followed by the variation of operating voltage measured macroscopically with reaction time. Operating voltages were experimentally measured at the different initial sodium dichromate concentrations of the anolyte in the electrosynthesis process of chromic anhydride, and the variation of operating voltage with reaction time was discussed. The mathematical model of the variation of operating voltages with reaction time and the rate of change equations of operating voltage were established. The model characterizes the change of operating voltages in the electrosynthesis process of chromic anhydride, and provides the foundations for the further study and process monitoring of the electrochemical synthesis of chromic anhydride.

**Key words** [chromic anhydride](#) [electrochemical synthesis](#) [operating voltage](#) [model](#)

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