

表面与界面工程

## 1,4-二氯苯在乙腈-水两相系统中的电化学氧化降解途径

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收稿日期 2009-7-15 修回日期 2009-10-15 网络版发布日期 2010-3-2 接受日期

摘要

研究了乙腈-水两相中Pt电极上1,4-二氯苯的降解途径和氧化特性。实验结果表明,1,4-二氯苯在乙腈-水两相中的氧化电位区间约为2.0~2.3 V(vs SCE),且氧化反应是受扩散控制的不可逆过程。液相色谱、液相色谱-质谱联用、离子色谱等的分析结果表明,乙腈-水两相中1,4-二氯苯氧化中间产物包括对氯苯酚、对苯醌、2,5-二氯对苯醌、草酸根离子、乙酸根离子、甲酸根离子、顺丁烯二酸根离子和氯离子,最终产物为H<sub>2</sub>O和CO<sub>2</sub>。得出了1,4-二氯苯主要的降解途径有两种。

关键词

[1,4-二氯苯](#) [Pt电极](#) [电化学氧化](#) [乙腈-水](#)

分类号

## Degradation pathways of 1,4-dichlorobenzene by electrochemical oxidation on platinum electrodes in acetonitrile-aqueous two-phase system

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### Abstract

The anodic oxidation of 1,4-dichlorobenzene in acetonitrile-aqueous solution was investigated on a platinum electrode. The cyclic voltammetric (CV) profiles showed that the oxidation potential region of 1,4-dichlorobenzene was about 2.0—2.3 V (vs SCE). Moreover, the effect of different scan rates on CV curves implied that oxidation reaction of 1,4-dichlorobenzene was controlled by diffusion process. Additionally, the major intermediates detected by liquid chromatography (LC) and liquid chromatography/mass spectrometry (LC/MS) were parachlorophenol, 1,4-benzoquinone and 2,5-dichloro-p-benzoquinone. The variation of the concentrations of related anions (oxalate, acetate, formate, maleate and chloride ion) during the reaction process was ascertained by ion chromatography (IC). On the basis of these findings, two tentative degradation pathways, hydroxyl radical attacking of the atom of carbon in benzene ring and dechlorination of 1,4-dichlorobenzene were described.

### Key words

[1,4-dichlorobenzene](#) [Pt electrodes](#) [electrochemical oxidation](#) [acetonitrile-aqueous](#)

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