

## 胞嘧啶电化学还原的ESR研究

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收稿日期 修回日期 网络版发布日期 接受日期

**摘要** 本文采用电化学方法-ESR检测联用装置,研究了胞嘧啶在阴极上还原产生自由基的ESR参数及其结构;同时研究了这一自由基的动力学性质,发现继电化学还原之后的化学反应也能产生自由基;提出并验证了相应的反应机理,求出有关的动力学参数.

**关键词** [氧化还原反应](#) [反应机理](#) [反应动力学](#) [结构分析](#) [电子自旋共振](#) [胞嘧啶](#) [电化学反应](#)

分类号 [0629](#) [0646](#)

## An ESR study on electrochemical reduction of cytosine

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**Abstract** ESR parameters and the structures of the free radicals produced from the reduction of cytosine in nonaq. solns. were studied by an electrochem. method in conjunction with ESR. The structure of the radical with ESR parameters of  $g = 2.002$ ,  $a_N = 1.05$  G,  $a_{1H} = 2.1$  G,  $a_{2H} = 1.05$  G was determine In the course of studies on the kinetic behavior of this radical, a new phenomenon was observed After the electrochem. reduction of cytosine was stopped, the concentration of this radical 1st increased and then decreased, through a max. in the whole growth and decay process. Thus, after the electrochem. reduction ceased, a subsequent chem. reaction continued to generate the radical as well. A reaction mechanism was suggested in which the 2-electron reduction product can react with the substrate cytosine, according to a reaction scheme presented in the text. Kinetic parameters  $k_1$  ( $4.9 \times 10^{-2}$  dm<sup>3</sup>/mol/s) and  $k_2$  (7.7 dm<sup>3</sup>/mol/s) were determine The experimental curves coincided well with curves derived from the numerical solution of the theor. model.

**Key words** [OXIDATION REDUCTION REACTION](#) [REACTION MECHANISM](#) [REACTION KINETICS](#) [STRUCTURAL ANALYSIS](#) [ELECTRON SPIN RESONANCE](#) [CYTOSINE](#) [ELECTROCHEMICAL REACTION](#)

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