药学学报 2001, 36(11) 844-848 DOI: ISSN: CN:

论文

H_2O_2存在下橙皮苷的极谱催化波机理及其应用

过玮;何盈盈;张清春;宋俊峰

西北大学化学系,陕西西安710069

摘要：

目的 研究在过氧化氢存在下橙皮苷极谱催化波产生机理,建立测定橙皮苷的极谱催化波新方法。方法用线性变位极谱法、循环伏安法等技术。结果 橙皮苷C-4位上的羰基C==O首先经单电子单质子还原为自由基,产生第1个还原波;该自由基的一部分由于共轭作用使其能量降低,并进一步还原,产生第2个还原波,另一部分发生二聚化反应。当氧化剂H_2O_2存在时,H_2O_2氧化橙皮苷羰基还原中间体自由基,阻断了该自由基进一步还原和二聚化反应,并使橙皮苷再生,产生橙皮苷的极谱催化波。在0.12mol·L^{-1} HAc-0.40mol·L^{-1} NaAc (pH 5.3)1.0×10^{-2}mol·L^{-1} H_2O_2支持电解质中,该催化波的一阶导数

关键词： 橙皮苷 过氧化氢 极谱催化波 自由基

MECHANISM OF THE POLAROGRAPHIC CATALYTIC WAVE OF HESPERIDIN IN THE PRESENCE OF HYDROGEN PEROXIDE AND ITS APPLICATION

GUO Wei; HE Ying-ying; ZHANG Qing-chun; SONG Jun-feng

Abstract:

AIM To study the mechanism of a polarographic catalytic wave of hesperidin in the presence of hydrogen peroxide, and to propose a new catalytic wave method for the determination of hesperidin. METHODS Linear-potential scan polarography, cyclic voltammetry and DC polarography were used in this work. RESULTS In 0.12 mol·L^{-1} HAc-0.40 mol·L^{-1} NaAc (pH 5.3) supporting electrolyte, the carbonyl group C==O of hesperidin at the C-4 position yielded two reduction waves. The carbonyl group C==O firstly undergoes a 1 e, 1H$^+$ reduction to form an intermediate free radical, producing the first reduction wave with peak potential -1.35 V (*vs* SCE). Further reduction of the radical was simultaneous with its dimerization. A part of the radical was further reduced, producing the second reduction wave with peak potential -1.70 V (*vs* SCE). Other part of the free radical was dimerized. The dimer could be oxidized at -1.17 V (*vs* SCE). When oxidant H_2O_2 was present, both the further reduction and dimerization were interrupted, and a polarographic catalytic wave was produced because H_2O_2 oxidized the intermediate free radical to regenerate the original C==O group. Based on the polarographic catalytic wave, a new method for the determination of hesperidin was proposed. 0.12 mol·L^{-1} HAc-0.40 mol·L^{-1} NaAc (pH 5.3)-1.0×10^{-2} mol·L^{-1} H_2O_2 solution was chosen as supporting electrolyte. The first-order derivative technique was used to eliminate the higher background current from H_2O_2 reduction and to well separate the catalytic wave from H_2O_2 reduction wave. The first-order derivative peak current of the catalytic wave is proportional to hesperidin concentration in the range of 1.0×10^{-7} -1.8×10^{-6} mol·L^{-1} with

Keywords: hydrogen peroxide polarographic catalytic wave free radical hesperidin

收稿日期 2001-03-09 修回日期 网络版发布日期

DOI:

基金项目:

通讯作者:

作者简介:

参考文献：

本刊中的类似文章

文章评论 (请注意:本站实行文责自负, 请不要发表与学术无关的内容!评论内容不代表本站观点.)

反馈人		邮箱地址	
反馈标题		验证码	5076