

阴离子交换离子色谱法测定乳酸催化制备的丙烯酸

石海宁¹, 王辉², 陶丽芝², 王宗花¹, 丁明玉^{2*}

1. 青岛大学国家培育基地-纤维新材料与现代纺织重点实验室, 山东 青岛 266071; 2. 清华大学化学系, 北京 100084

Determination of acrylic acid from catalytic preparation lactic chromatography

SHI Haining¹, WANG Hui², TAO Lizhi², WANG Zonghua¹, DING Mingyu^{2*}

1. Laboratory of Fiber Materials and Modern Textile, the Growing Base for State Key Laboratory, Qingdao University of Chemistry, Tsinghua University, Beijing 100084, China

摘要

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摘要 通过乳酸催化脱水制备丙烯酸具有良好的应用前景。为了对其中的催化过程进行有效、及时的监控,建立了一种同时测定乳酸及离子交换色谱法(AEC)。选择Metrohm A Supp 5阴离子交换柱(150 mm×4.0 mm),以2 mmol/L Na₂CO₃+2 mmol/L NaHCO₃液为流动相,采用化学抑制电导检测技术,乳酸和丙烯酸在6 min内即可实现完全分离。乳酸和丙烯酸工作曲线的线性范围分别为0.1~200 mg/L,检出限分别为0.030 mg/L和0.035 mg/L,加标回收率分别为100.7%~106%和99.6%~103%,相对标准偏差分别为2.16%~2.49%和2.42%~2.48%。该方法准确、快速、灵敏、重现性好。

关键词: 阴离子交换色谱法 乳酸 丙烯酸 催化制备

Abstract: Acrylic acid is a kind of important monomer and basic organic chemical raw material. In the process catalytic preparation of acrylic acid from lactic acid, in order to monitor the catalytic process effectively and timely, anion-exchange chromatographic (AEC) method has been established for the simultaneous determination of lactic acid and acrylic acid. The separation was carried out on a Metrohm A Supp 5 anion-exchange column (150 mm×4.0 mm) with 2 mmol/L Na₂CO₃+2 mmol/L NaHCO₃ as the mobile phase. The flow rate of the mobile phase was 0.7 mL/min. A chemically suppressed conductivity detector was used. The linear ranges of calibration curves were 0.1-500 mg/L for lactic acid and 0.1-200 mg/L for acrylic acid. The detection limits with S/N=3 were 0.030 mg/L for lactic acid and 0.035 mg/L for acrylic acid. The recoveries of lactic acid and acrylic acid were 100.7%-106% and 99.6%-103% with their standard deviations of 2.16%-2.49% and 2.42%-2.48%, respectively. This method is accurate, speedy, sensitive, and has been successfully used for the determination of lactic acid and acrylic acid in the catalytic product.

Keywords: anion-exchange chromatography lactic acid acrylic acid catalytic preparation

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Corresponding Authors: 丁明玉

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