

研究论文

固相萃取-离子色谱法测定饮用水中的痕量卤代乙酸

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收稿日期 2005-7-20 修回日期 2005-9-25 网络版发布日期 2006-6-1 接受日期

摘要 建立了固相萃取-离子色谱(SPE-IC)测定饮用水中痕量卤代乙酸(HAAs)(包括一氯乙酸、二氯乙酸、三氯乙酸、一溴乙酸和二溴乙酸)的方法。固相萃取采用LiChrolut EN SPE柱来进行痕量待测物的预浓缩(25倍)和基体杂质的消除,用NaOH(10 mmol/L)洗脱;色谱分离采用亲水性、高容量、氢氧化物选择型阴离子交换柱Dionex IonPac AS16(250 mm×4 mm i. d.),以NaOH为流动相进行浓度梯度淋洗,淋洗速度为0.8 mL/min,电导检测,进样量为500 μL。结果表明,用SPE-IC法测定HAAs,一溴乙酸的检测限为12.5 μg/L,其余4种HAAs的检测限为0.38~1.69 μg/L。该法可实现对饮用水中痕量卤代乙酸的测定。

关键词 [固相萃取](#) [离子色谱](#) [梯度淋洗](#) [痕量卤代乙酸](#) [饮用水](#)

分类号

Determination of Trace Haloacetic Acids in Drinking Water Using Ion Chromatography Coupled with Solid Phase Extraction

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Abstract

The combined solid phase extraction (SPE)-ion chromatography (IC) method was developed for the analysis of trace haloacetic acids (HAAs) in drinking water. The tested HAAs included monochloroacetic acid (MCAA), dichloroacetic acid (DCAA), trichloroacetic acid(TCAA), monobromoacetic acid (MBAA) and dibromoacetic acid (DBAA). For trace determination of HAAs in real drinking water samples, conditions of LiChrolut EN SPE cartridge were investigated for HAAs preconcentration and matrix elimination. Elution was carried out by 2 mL of sodium hydroxide (10 mmol/L) with the flow rate of 2 mL/min. The Dionex IonPac AS16 column (250 mm×4 mm i.d.), a high capacity and hydroxide-selective anion-exchange column designed for the determination of polarizable anions, was chosen for chromatographic separation. HAAs were analyzed with a concentration gradient of NaOH with the flow rate of 0.8 mL/min and detected by suppressed conductivity. A 500 μL sample loop was used. The detection limits of this SPE-IC method for MCAA, DCAA, DBAA and TCAA were 0.38-1.69 μg/L and MBAA was 12.5 μg/L under 25-fold preconcentration. The results demonstrate that the method is suitable for the analysis of trace haloacetic acids in drinking water.

Key words [solid phase extraction \(SPE\)](#) [ion chromatography \(IC\)](#) [gradient elution](#) [trace haloacetic acids](#) [drinking water](#)

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