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用同位素稀释电感耦合等离子体质谱法测定海水中的痕量铅

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摘要 5-磺基-8-羟基喹啉用作微柱流动注射在线分离、富集和电感耦合等离子体质谱分析流程中的螯合剂,与铅反应生成铅螯合物被硅酸镁吸附剂吸附,实现痕量铅的分离、富集。对联用系统的参数如螯合剂用量、淋洗条件、洗脱条件和进样量等进行最优化,测定标准水样和加标海水的铅回收率分别为101%和97.9%,相对标准偏差为±0.98%,检测限为0.204μg/L。可应用于生物、环境等高盐样品中铅的在线分离测定

关键词 质谱学 痕量铅测定 电感耦合等离子体质谱 海水 微柱流动注射 同位素稀释

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Determination of Trace Lead in Seawater Using Isotope Dilution by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

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Abstract The chelating reaction of lead with 8-hydroquinoline-5-sulfonic acid (8-HQS) is used for measuring trace lead in seawater. The detection limits of this method estimated with 3σ of the procedure blank is 0.204 μg/L. The recovery of spiked Pb standard in seawater is 97.9%. The relative standard deviation(s r) is ±0.98%. The certification reference water (GBW 08607) is used to assess the accuracy of this method. The result is in good agreement with the certified value and the recovery is 101%. The parameters of the hyphenated technique, such as the concentration of 8-HQS, sample loading time and speed, washing time, eluent acid concentration and instrumental parameters of MFI-ICP-MS are optimized. This method can be recommended to determine the trace lead concentration in high salt matrix of samples.

Key words mass spectrometry determination of trace lead inductively coupled plasma mass spectrometry (ICP-MS) seawater micro-flow injection (MFI) isotope dilution (ID)

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