

论文

分散液-液微萃取/高效液相色谱法测定水样中的痕量双酚A

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摘要:

建立了分散液-液微萃取与高效液相色谱联用技术测定水样中痕量双酚A(BPA)的方法. 通过对实验条件的筛选及优化, 得到最佳条件: 22.5 μ L氯苯作萃取剂、0.5 mL丙酮作分散剂、0 min静止萃取时间、调节pH 3.2左右、10%离子强度及9 mL水样体积. 此条件下方法的线性范围为0.5~100 μ g/L($R^2=0.9941$), 检出限为0.10 μ g/L. 在BPA质量浓度为1 μ g/L条件下, 方法回收率为87.8%~111.0%, 相对标准偏差8.3%($n=5$), 富集倍数范围1905~2527. 对添加不同BPA浓度的自来水、地表水及回用中水进行分析, 回收率分别为(108 \pm 11.1)%, (107 \pm 13.2)%及(81.2 \pm 6.2)%($n=3$). 在既定的色谱条件下, BPA的测定不受乙炔基雌二醇、雌二醇、雌三醇、雌酮和壬基酚等雌激素的干扰.

关键词: 分散液-液微萃取 高效液相色谱法 双酚A 氯苯 丙酮 雌激素

Determination of Trace Bisphenol A in Water by High Performance Liquid Chromatography with Dispersive Liquid-liquid Microextraction

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Abstract:

Determination of bisphenol A(BPA) of trace level in water was performed by dispersive liquid-liquid microextraction(DLLME) and high performance liquid chromatography. The optimal conditions of 22.5 μ L of extraction solvent(chlorobenzene), 0.5 mL of disperser solvent(acetone), 0 min of extraction time, 10% of ionic strength, 3.2 of pH value and 9 mL of water sample volume, were obtained by screening and optimization design. Under the optimum conditions, the linear range is 0.50—100 μ g/L($R^2=0.9941$) and the limit of detection is 0.10 μ g/L for determination of BPA. The recovery from 87.8% to 111.0%, RSD of 8.3%($n=5$) and enrichment factor from 1905 to 2527 were obtained at a mass concentration of BPA of 1 μ g/L. The relative recoveries of BPA from tap water, river water and recycled water at spiking different levels are (108 \pm 11.1)%, (107 \pm 13.2)%, and (81.2 \pm 6.2)%($n=3$), respectively. Moreover, under the determined chromatographic conditions, the effects of acetylene estradiol, estradiol, estriol, estrone and nonylphenol on the determination of BPA in water by high performance liquid chromatography with dispersive liquid-liquid microextraction were not of existence.

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