

研究论文

## 离子色谱法同时测定离子液体中六氟磷酸根及痕量杂阴离子

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**摘要** 建立了一种同时测定离子液体中六氟磷酸根(PF<sub>6</sub><sup>-</sup>)和痕量杂阴离子氟、氯、溴(F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>)的离子色谱方法(IC)。样品经溶解、稀释、过滤后用Dionex IonPac AS22分离柱(250 mm×4 mm)分离,淋洗液为碳酸盐-乙腈体系(体积比为70:30),流速1.0 mL/min,采用Dionex DS6电导检测器检测,外标法定量。F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>和PF<sub>6</sub><sup>-</sup>的线性范围分别为0.5~50 μg/L、10~200 μg/L、10~200 μg/L和0.9~45 mg/L,线性相关系数分别为0.9999, 0.9998, 0.9999和0.9998,加标回收率为94.5%~100.5%,相对标准偏差为0.63%~1.03%,检出限(以信噪比为3计)分别为0.5 μg/L、2.0 μg/L、5.0 μg/L和0.9 mg/L。该方法用于离子液体中六氟磷酸根和痕量杂阴离子的同时测定,结果令人满意。

**关键词** [离子色谱](#) [六氟磷酸根](#) [阴离子](#) [离子液体](#)

## Simultaneous determination of hexafluorophosphate and other trace impurity anions in ionic liquids by ion chromatography

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### Abstract

A method was developed for the simultaneous determination of hexafluorophosphate and other trace impurity anions in ionic liquids by ion chromatography (IC). The sample was diluted with 70% (v/v) acetonitrile, filtrated by 0.22 μm nylon filter membrane, and then analyzed by IC. The analytical column was Dionex IonPac AS22 (250 mm×4 mm), carbonate-acetonitrile (70:30, v/v) was used as the eluent at a flow rate of 1.0 mL/min. The detection was performed by a Dionex DS6 conductivity detector. The quantitative analysis of external standard calibration curves was used. The linear ranges of the method for F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup> and PF<sub>6</sub><sup>-</sup> were 0.5~50 μg/L (r0.9999), 10~200 μg/L (r0.9998), 10~200 μg/L (r0.9999) and 0.9~45 mg/L (r0.9998), respectively. The average recoveries were 94.5%~100.5% with the relative standard deviations of 0.63%~1.03%. The detection limits (S/N3) were 0.5 μg/L, 2.0 μg/L, 5.0 μg/L and 0.9 mg/L for F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup> and PF<sub>6</sub><sup>-</sup>, respectively. The method has been applied to determine hexafluorophosphate and other trace impurity anions in ionic liquids with satisfactory results.

**Key words** [ion chromatography \(IC\)](#) [hexafluorophosphate](#) [anion](#) [ionic liquids \(ILs\)](#)

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