

Simple and Accurate Method for the Determination of Fluoride in Salts

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Summary

We improved transient isotachopheresis (tITP) – capillary zone electrophoresis (CZE) developed for fluoride (F^-) in seawater to establish a simple method for determination of F^- in salts. The limit of detection (LOD, $S/N = 3$) and limit of quantification (LOQ, $S/N = 10$) for F^- respectively reached 0.007 and 0.023 mg/L using a capillary with larger inner diameter (100 μm). The respective values of the relative standard deviation (RSD, $n = 4$) of the migration time, peak area, and peak height for F^- were 0.35, 2.7, and 2.7%. Effects of coexisting components such as aluminum (Al^{3+}), iron (Fe^{3+}), magnesium (Mg^{2+}), and calcium (Ca^{2+}) were examined. The adverse effects were resolved using metal complexation with diethylenetriamine pentaacetic acid (DTPA). The proposed method was applied to the determination of F^- in salt samples. Results for CZE agreed with those obtained using a conventional spectrophotometry.