Use of the Eurachem (Quam) Guide on the Analytical Validation for Inorganic Anion Analysis by Capillary Ion Electrophoresis

By **Juan Carlos Raposo Sep 13, 2013 10:58 am EDT**

Capillary ion electrophoresis (CIE) with indirect ultraviolet (UV) detection was used for separation and quantification of several inorganic anions such as bromide, chloride, sulphate, nitrite, nitrate, fluoride, and phosphate in different natural and wastewater samples. This paper illustrates setting-up and interpreting a validation methodology for this analytical method. The different recommendations suggested by official guidelines (Eurachem Guide and EPA 6500) for the analytical validation were applied in order to guarantee that the analytical procedure gave reliable, exact, and interpretable information about the different kind of water samples.

The analytical method precision, trueness, calibration curve linearity, selectivity, robustness, detection limits, repeatability, level of uncertainty, and time stability of the sample and the standard were the main validation characteristics tested.

Effective separation of the seven small anions up to the concentrations of 40 mg/l was achieved in less than six minutes. The method yielded precisions of 0.4–5.2% (*RSD*, *n*=10) and detection limits of 0.15 (Br^-), 0.05 (Cl^-), 0.08 (SO_4^{2-}), 0.04 (NO_3^-), 0.09 (NO_2^-), 0.008 (F^-), and 0.02 mg l^{-1} (HPO_4^{2-}). The results of the CIE method were compared to ion chromatography analysis for bromide and nitrite anions, and consistent results were finally obtained.

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