

Evaluation of the potentiometric determination of trace fluoride in natural and drinking water with a fluoride ISE

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Abstract

The performance of the fluoride ion selective electrode (F-ISE) potentiometric method was evaluated for fluoride determination in natural and drinking water and the pitfalls that could prevent accurate analyses were assessed. Guidelines are provided for the accurate implementation of the F-ISE method for low-level F^- determination in the routine analytical laboratory. The following aspects were evaluated: minimising electrode drift, electrode care and optimisation, the use of different TISAB (total ion strength adjustment buffer) solutions, calibration procedures for trace F^- , interference correction procedures, matrix effects, and the determination of the analytical parameters. The methodologies and procedures proposed in this work were applied in an SABS proficiency testing programme (Water Check Programme-2004) which included low-level F^- determination in natural water and synthetic samples with varying amounts of possible interfering elements. The accuracy of the results was excellent confirming the versatility of F-ISE for low-level F^- determinations in routine laboratories provided that the correct analytical procedures are followed and common pitfalls are avoided.

Keywords: F^- determination, F-ISE, F^- in drinking water