

## ABSTRACT

The nitrate-selective copperised-cadmium (Cu-Cd) reduction reaction coupled directly to the highly sensitive nitrite ion chromatographic detection, produced a more precise method for determination of nitrate than any one of the two conventional methods. A borate buffer solution used in the reduction reaction, in place of the conventional ammonium-EDTA buffer solution, eliminated interferences from co-eluting ions in the subsequent ion chromatographic detection of nitrite. Optimised experimental conditions included using a packed-bed Cu-Cd reductor column length of 12.5 cm, a solution flow rate of 3.0 ml/min, and using 10.0 ml of borate buffer solution for each 20.0 ml of nitrate-containing solution. Precision was high for results obtained within a greatly extended linear dynamic range of 0.006-1.20 mg/l NO<sub>3</sub><sup>-</sup>, with a much lower limit of detection of 0.40 microg/l NO<sub>3</sub><sup>-</sup>. Cu-Cd reductor column efficiency was 98.20+/-6.03%. Validation of the method was undertaken using certified reference materials. The method was successfully applied to analysis of dam water, river water and storm water samples, producing more precise results than either the conventional colorimetric method or the conventional ion chromatographic method.