CAPSULES
preliminary notes and applications from Bioanalytical Systems, Inc.

Determination of Nitrite by LCEC/LCUV

Purpose

Develop a method, which can easily quantitate 100 ppb amounts of sodium nitrite in water samples.

Existing Methods

Various approaches for the determination of nitrite are available, including spectrophotometric methods using the reaction of nitrite with hemoglobin and the Greiss reagent [1], liquid chromatography with Cd tubular electrochemical detection [2,3] and chemiluminescence detection [4]. These methods are satisfactory for many purposes. However, we wanted to explore whether LCEC/LCUV with a C_{18} column, modified by adding an ion-pairing agent to the mobile phase, might be reliable and give good detection limits. The following LCEC/LCUV method is relatively simple and rapid.

LCEC Conditions

System: BAS-480
EC Detector: BAS LC-4C Amperometric detector
Potential: + 1.10V vs. Ag/AgCl
UV Detector: BAS UV-116A UV/Vis detector
Wavelength: 230 nm
Column: Phase II, 3 µM ODS 100 x 3.2 mm (BAS, P/N MF-6213)
Mobile phase: 11.25 mM heptylamine phosphate (pH 6.4), flow rate, 1 mL/min
Amount injected: 20 µL
Temperature: Ambient

Notes

Representative chromatograms of sodium nitrite in mobile phase are shown in F1. Sodium nitrite is weakly retained (2.2 minutes) which makes it possible to process ca. 20 samples and standards per hour if no late eluting detectable substances are present.

Calibration curves using both EC and UV detection for injected sodium nitrite standards are shown in F2.

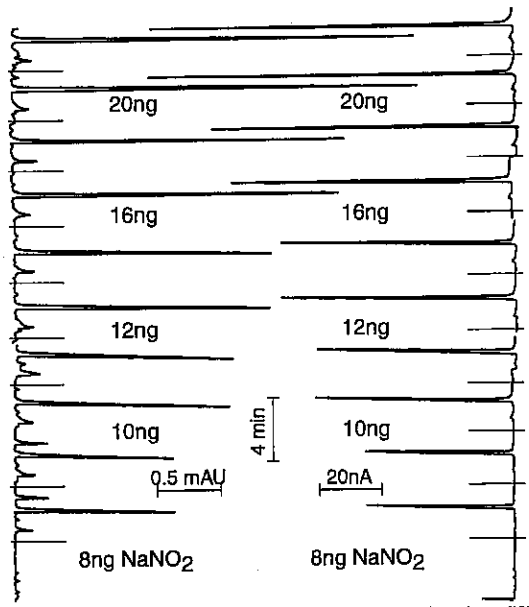

Figure 1. Chromatograms of sodium nitrite in different amounts determined by LCEC (right) and LCUV (left).

CALIBRATION CURVE OF SODIUM NITRATE

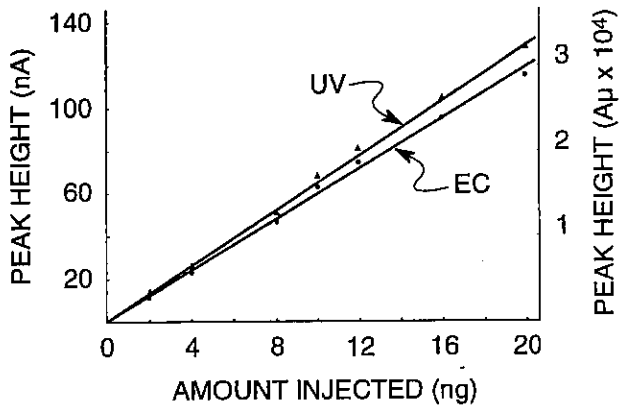

Figure 2. Linear relationships of sodium nitrite concentration and peak height detected by EC and UV.

1. *D.S. Bredt and S.H. Snyder, Pro. Natl. Acad. Sci. USA, 86 (1989) 9030.*
2. *R.J. Davenport and D.C. Johnson, Anal. Chem., 46 (1974) 1971.*
3. *R.G. Gerritse, J. Chromatogr., 171 (1979) 527.*
4. *N.P. Sen, P.A. Baddoo, S.W. Seaman, J. Chromatogr.,673 (1994) 77.*