

*'...concern for
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Azide in Air

Introduction

Concern for the health of workers exposed to toxic vapours in industries where sodium azide is processed, *e.g.*, in the manufacture of explosives, pharmaceuticals and pesticides, has led to the publication of a number of methods for the detection of azide at trace levels in the environment.

One of the most sensitive of these methods was developed by Stephen Swarin and Richard Waldo at General Motors (Reference 1) following a proposal that sodium azide be used as a nitrogen gas generant in 'air bags' for occupant restraint in automobile collisions. They derivatised azide samples with 3,5-dinitrobenzoyl chloride prior to reversed phase analysis by HPLC.

In this communication, automation of their procedure via the GBC 1650 Autosampler is described.

Keywords:

Sodium azide, Hydrazoic acid, Automated pre-column derivatisation, Environmental pollution

Conditions

Column: Spherisorb S5 ODS2,
250 x 4.6 mm ID
Guard: Spherisorb S5 ODS2,
50 x 4.6 mm ID
Mobile Phase: 50% Acetonitrile in water (v/v)
Flow Rate: 1 ml/min
Temperature: 35°C
Wavelength: 240 nm
Injection Vol.: 25 µl

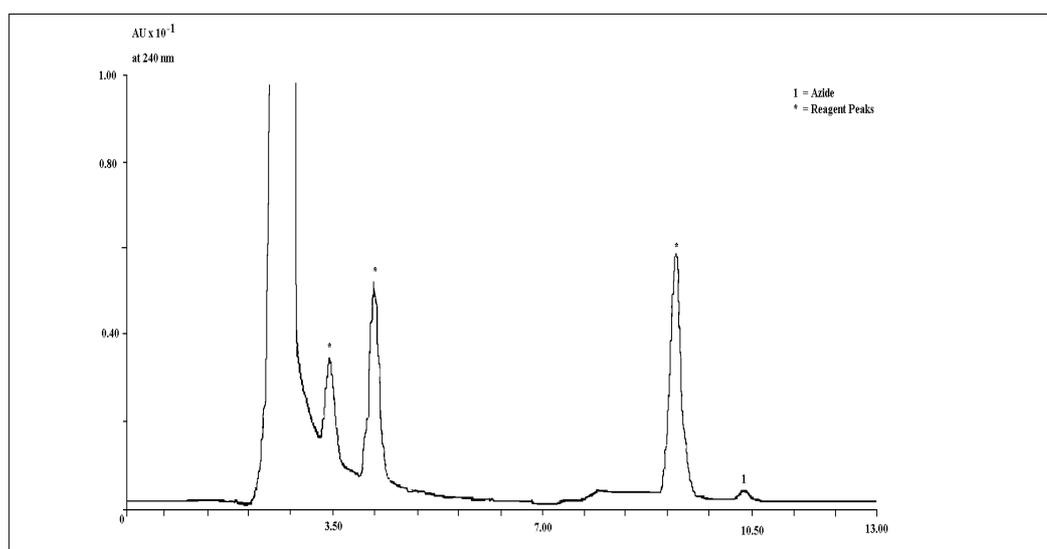


Figure 1 Azide in factory air samples at ppt levels



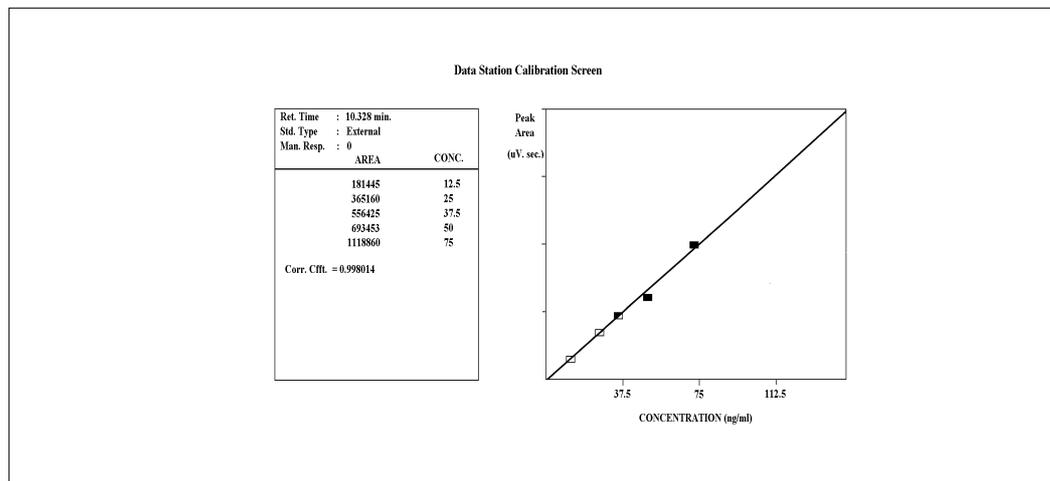


Figure 2 Five Point Calibration for Azide Standards

Procedure

The method is based on that of Swarin and Waldo. Known volumes of air were passed through midget impingers containing 0.01 M sodium carbonate solution. The pH of the solution was adjusted to pH 5 with 0.2 M hydrochloric acid and samples were loaded into the autosampler carousel. 50 µl of sample was mixed with 50 µl of a solution of 3,5-dinitrobenzoyl chloride in acetonitrile (1 mg/ml) using the robotic functions of the LC1650 autosampler. After three minutes, 25 µl of the reaction mixture was injected. 3,5-Dinitrobenzoyl azide eluted at 10.3 minutes and was quantitated by peak area using a five-point external standard calibration generated by the Data Station (Figure 2).

Unlike ion chromatography procedures, this method is not subject to interference by bromide, nitrate and nitrite ions. The method is fast, specific and highly sensitive (ppt detection) and may be run on a simple, isocratic HPLC system. Furthermore, the operation may be fully automated.

GBC HPLC Instrumentation

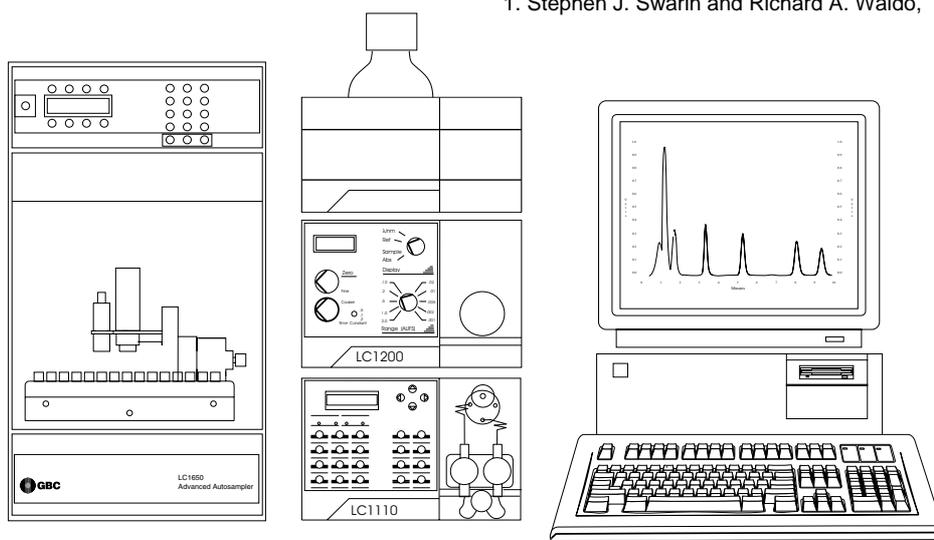
LC1110 Dual Piston HPLC Pump
 LC1200 Variable Wavelength UV/Vis Detector
 LC1650 Advanced Autosampler
 GBC Column Heater
 WinChrom Chromatography Data Management System

Reference

1. Stephen J. Swarin and Richard A. Waldo,



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'Journal of Liquid Chromatography', 1982, 5(4), 597.

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