

'...the use of UV detection at 340 nm provides sensitivity in the parts per trillion range...'

Formaldehyde in Air

Formaldehyde is a powerful antiseptic widely used as a fumigant for dwellings, ships, warehouses and clothing. It is also employed in the manufacture of phenolic resins, dyes, organic chemicals, glass mirrors, explosives, leather goods and latex rubber products. Formaldehyde vapours present in the workplace are lachrymatory and intensely irritating to mucous membranes even at low concentrations. As a result, responsible employers frequently monitor the level of formaldehyde in factory air.

There are a number of methods available for such purposes, but trapping the aldehyde in impingers containing a solution of 2,4-dinitrophenylhydrazine is perhaps the most simple. Formation of the corresponding phenylhydrazone is rapid and the product is quite stable. Reversed phase HPLC separates the formaldehyde-2,4-dinitrophenylhydrazone from the other species present, while the use of UV detection at 340 nm provides sensitivity in the parts per trillion range. Chromatograms obtained for a formaldehyde 2,4-DNPH standard and an air sample are present in Figures 1 and 2 respectively.

Keywords:
Air Pollution, Formaldehyde, 2,4-Dinitrophenylhydrazine (2,4-DNPH)

Conditions

Column: Spherisorb S5 ODS2,
250 x 4.6 mm ID
Guard: Spherisorb S5 ODS2,
50 x 4.6 mm ID
Mobile Phase: Acetonitrile:Water (50:50)
Flow Rate: 1 ml/min
Detection: UV at 340 nm



E8

01-0354-00

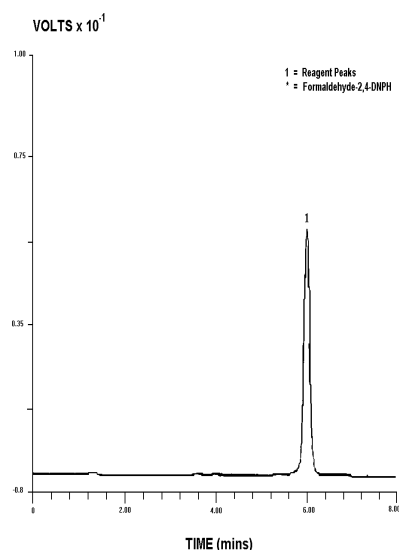


Figure 1 Formaldehyde-2,4-DNPH

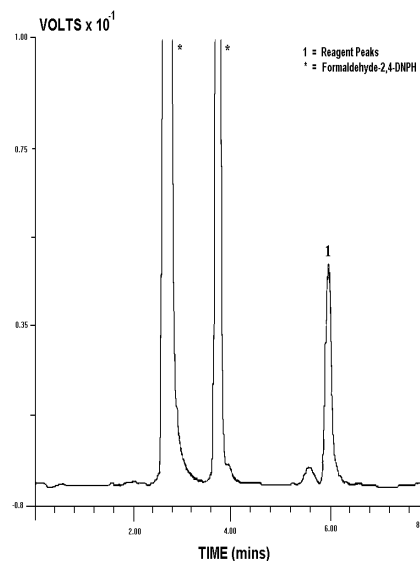
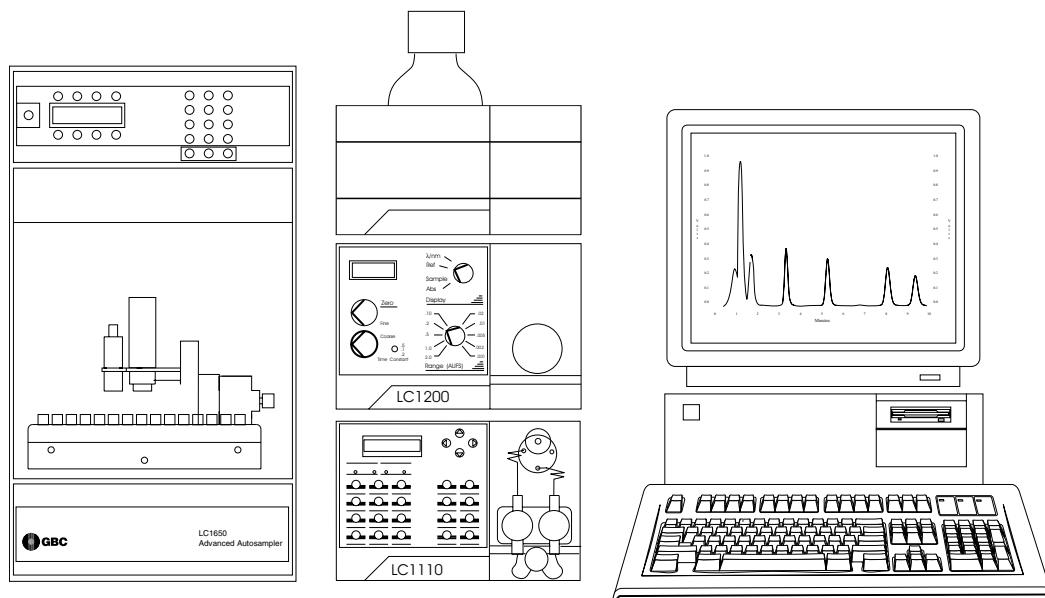


Figure 2 Factory air sample

GBC HPLC Instrumentation

LC1110 Dual Piston HPLC Piston
LC1200 Variable Wavelength UV/Vis
Detector
LC1445 System Organiser
LC1650 Advanced Autosampler
WinChrom Chromatography Data
Management System



E8
01-0354-00

GBC Scientific Equipment Pty Ltd
A.C.N. 005 472 686
12 Monterey Road, Dandenong, Victoria, 3175, Australia
Phone: (03) 9213 3666 Fax: (03) 9213 3677

All rights reserved
GBC publication number 01-0354-00
September, 1995