

Analysis of 2,4-DNPH Derivatised Aldehydes by HPLC-DAD

Application Note

AN0062

INTRODUCTION

Aldehydes are important compounds regularly use in the chemical industry. Sick house syndrome is a medical condition caused by poor air quality in enclosed indoor spaces and the presence of specific volatile organic compounds (VOCs) such as formaldehyde. It is vital that the level of formaldehyde and associated compounds are regularly measured and controlled especially in working environments in which formaldehyde is handled.

SCION Instruments developed a method for the simultaneous analysis of seven DNPH (2,4-Dinitrophenylhydrazine) derivatised aldehydes plus one derivatised ketone.

EXPERIMENTAL

A SCION 6000 HPLC with DAD was used with a C18 reverse phase column for the simultaneous identification of eight target compounds. An analytical standard containing all target analytes was analysed to demonstrate identification and separation of all compounds.

An ambient air sample was collected in a trap tube filled with silica gel which contained 2,4-DNPH. The aldehydes and ketone present in the ambient air were collected on the trap and derivatised before being eluted with acetonitrile and analysed.

Table 1 details the analytical conditions of the HPLC-DAD.

Conditions	
Column	C18 5µm x 4.6mm ID x 150mm
Column Temp	40°C
Mobile Phase	Acetonitrile: Methanol (60:40 v/v)
Flow Rate	1mL/min
Injection Vol	10µL
DAD	360nm

Figure 1 shows the chromatogram of all target compounds analysed at 0.5mg/L, along with peak identifiers.

RESULTS

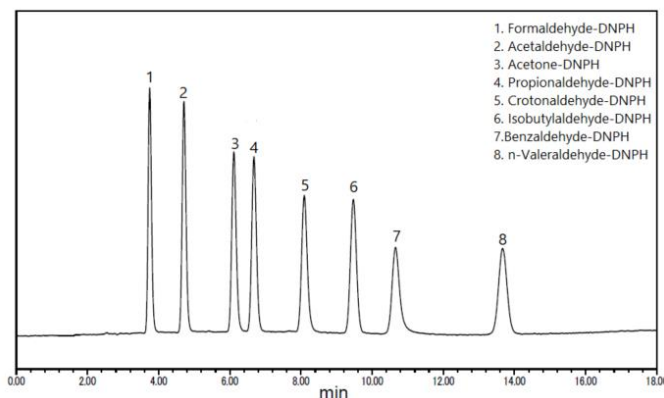


Figure 1. 7 DNPH aldehydes and 1 DNPH ketone (0.5mg/L)

As shown in Figure 1, all target analytes were completely resolved from each other in under 15 minutes.

Limit of detection studies were completed for Formaldehyde and Acetaldehyde. The limited of detection for Formaldehyde in ambient air was 0.02µg/m³ and 0.1µg/m³ for Acetaldehyde, respectively.

CONCLUSION

SCION Instruments offers an easy solution for the simultaneous identification of seven DNPH derivitised acetaldehydes and one DNPH derivitised ketone using the SCION 6000 HPLC-DAD system. Complete separation and low detection limits were observed when ambient air samples were analysed.