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Applikationsbericht

EPA Method 554.0 Determination of Carbonyl Compounds in Drinking Water by Dinirtophenyldydrazine Derivatization and High Performance Liquid Chromatography

Waters Corporation

This is an Application Brief and does not contain a detailed Experimental section.

Abstract

Large quantities of carbonyl compounds are used worldwide, primarily in the chemical and plastics industries. Demonstrated to be potentially carcinogenic, these compounds have been found in industrial waste where they can to leach into groundwater supplies.

Introduction

Large quantities of carbonyl compounds are used worldwide, primarily in the chemical and plastics industries. Demonstrated to be potentially carcinogenic, these compounds have been found in industrial waste where they can to leach into groundwater supplies and contaminate drinking water.

Experimental

HPLC conditions

Instrument:	Waters Alliance HPLC system with UV detection
Eluent:	Water/tetrahydrofuran/acetonitrile
Column:	Waters XBridge Phenyl, 3.5 µm, 4.6 x 150 mm @ 35 °C
Injection:	20 µL each of AccuStandard mix (M- 8315-R1-DNPH and M- 8315-R2- DNPH) diluted 1:5 in 40:60 water/acetonitrile
Flow Rate:	1.5 mL/min

Detection:	UV @ 360 nm
Data:	Waters Empower software

Sample preparation

DNPH reagent added to 100 mL sample, extract with Oasis HLB or use methylene chloride extraction option.

Eluent preparation

Filter and degas through a 0.45 µm filter.

A: 90% water, 10% tetrahydrofuran (THF) Mix 900 mL water and 100 mL stabilized THF.

B: Acetonitrile

Eluent gradient for EPA methods 554 and 8315 Option 1.

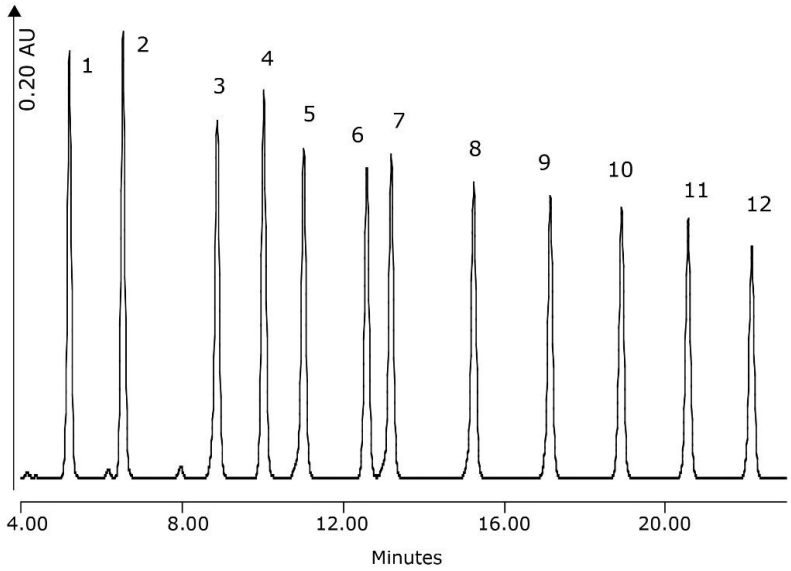
Time	Flow	%A	%B	Curve
Initial	1.5	70	30	-
20	1.5	36	64	6
22	1.5	36	64	6
22.1	1.5	70	30	6

Eluent gradient for EPA methods TO11 and 8315 Option 2

Time	Flow	%A	%B	Curve
Initial	1.5	70	30	-
16	1.5	53	47	6
21	1.5	53	47	6

Time	Flow	%A	%B	Curve
21.1	1.5	70	30	6

Results and Discussion



Peak	Analyte	Peak	Analyte
1	Formaldehyde	7	Pentanal
2	Acetaldehyde	8	Hexanal
3	Propanal	9	Heptanal
4	Crotonaldehyde	10	Octanal
5	Butanal	11	Nonanal
6	Cyclohexanone	12	Decanal

EPA method 554 and 8315-01 analytes, 20 parts per million (ppm) as DNPH analytes.

References

1. Analysis of DNPH Derivatives Using XBridge Phenyl WA60186

2. Fast Analysis of Aldehydes and Ketones using UPLC 720001860EN

Featured Products

Alliance HPLC System <https://www.waters.com/534293>

Empower 3 Chromatography Data Software <https://www.waters.com/10190669>

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