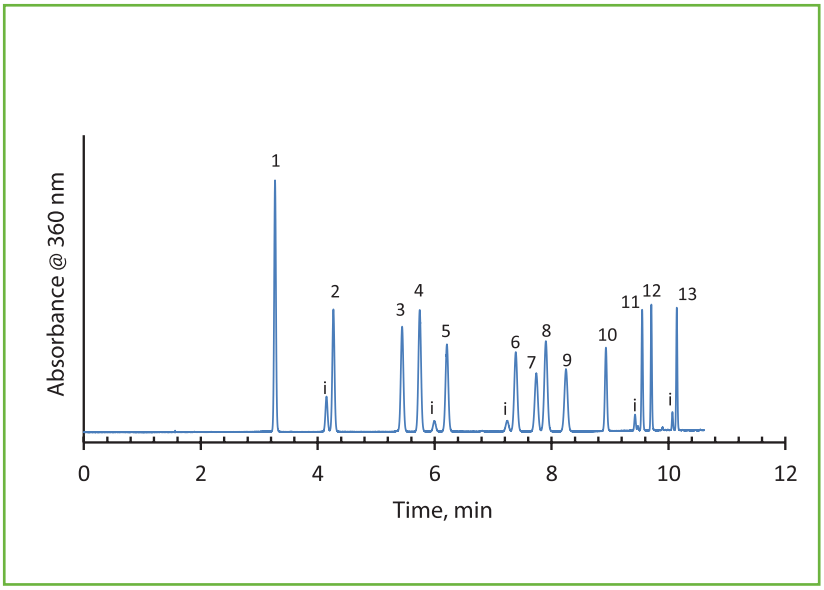
Separation of Carbonyl Compounds as Dinitrophenylhydrazone Derivatives on HALO® C18, 2.7 µm

Application Note 90-DNPH



PEAK IDENTITIES:

1. Formaldehyde-2,4-DNPH
2. Acetaldehyde-2,4-DNPH
3. Acetone-2,4-DNPH
4. Acrolein-2,4-DNPH
5. Propionaldehyde-2,4-DNPH
6. Crotonaldehyde-2,4-DNPH
7. 2-Butanone-2,4-DNPH
8. Methacrolein-2,4-DNPH
9. Butyraldehyde-2,4-DNPH
10. Benzaldehyde-2,4-DNPH
11. Valeraldehyde-2,4-DNPH
12. m-Tolualdehyde-2,4-DNPH
13. Hexaldehyde-2,4-DNPH

2,4-DNPH = 2,4-Dinitrophenylhydrazone
i = anti, syn, isomers of the respective DPNH derivatives

TEST CONDITIONS:

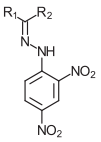
Column: HALO 90 Å C18, 2.7 µm, 4.6 x 150 mm
Part Number: 92814-702
Mobile Phase: 55/45 - A/B
A: Water
B: Acetonitrile/THF (80/20)
Gradient:

Time (min)	% B
0.0	45
7.5	58
9.0	80
12.0	80

Flow Rate: 1.5 mL/min
Pressure: 355 bar
Temperature: 30 °C
Detection: UV 360 nm, VWD
Injection Volume: 0.3 µL
Sample Solvent: Acetonitrile
Response Time: 0.02 sec
Flow Cell: 2.5 µL semi-micro
LC System: Shimadzu Prominence UFLC XR
Extra Column Volume: ~14 µL

This separation is based on modified EPA methods 8315 and 554 and achieves baseline resolution of the sample components by the use of a small particle size packing and a mobile phase containing both acetonitrile and tetrahydrofuran (THF). The addition of THF is necessary to achieve this resolution. As a result, peak elution order is also changed.

STRUCTURES:

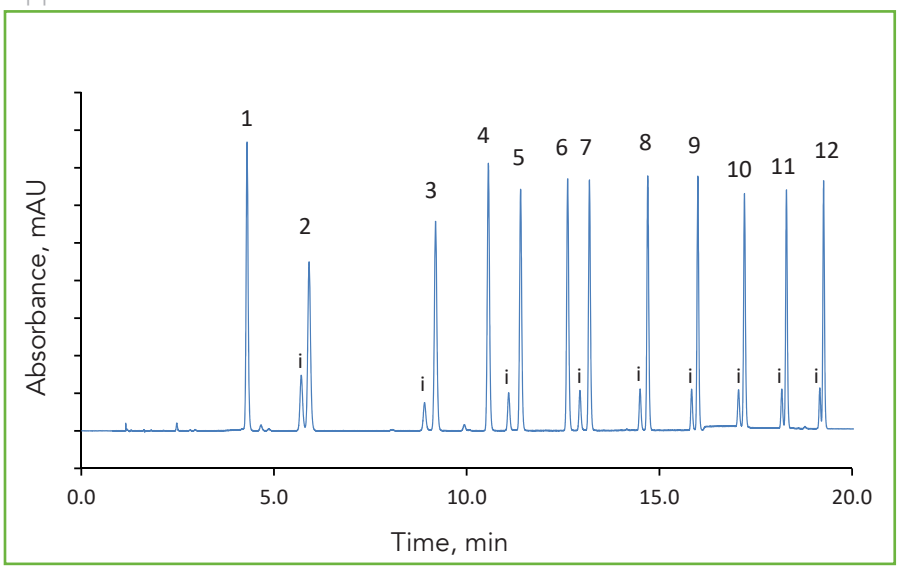


General -2,4-DNPH structure

Peak	R 1	R 2
1	-H	-H
2	-H	—CH_3
3	—CH_3	—CH_3
4	-H	CH_2 H
5	-H	CH_3
6	-H	H CH_3 H
7	—CH_3	CH_3
8	-H	CH_2 CH_3
9	-H	CH_3
10	-H	
11	-H	CH_3
12	-H	CH_3
13	-H	$(CH_2)_4$ CH_3

Separation of Carbonyl Compound DNPH Derivatives on HALO® C18, 5 µm

Application Note 156-DNPH



PEAK IDENTITIES:

1. Formaldehyde-2,4-DNPH
2. Acetaldehyde-2,4-DNPH
3. Propionaldehyde-2,4-DNPH
4. Crotonaldehyde-2,4-DNPH
5. Butyraldehyde-2,4-DNPH
6. Cyclohexanone-2,4-DNPH
7. Valeraldehyde-2,4-DNPH
8. Hexaldehyde-2,4-DNPH
9. Heptaldehyde-2,4-DNPH
10. Octylaldehyde-2,4-DNPH
11. Nonaldehyde-2,4-DNPH
12. Decaldehyde-2,4-DNPH

*DNPH = Dinitrophenylhydrazone
i = anti, syn, isomers of the respective DNPH derivatives

A fast, high resolution separation of carbonyl-DNPH derivatives is performed on a HALO® C18, 5 µm column. DNPH, or 2,4-Dinitrophenylhydrazine is used to derivatize these highly volatile and reactive carbonyl compounds. It is important to monitor the levels of these reactive compounds in the environment because they are combustion byproducts found in air, water and soil.

TEST CONDITIONS:

Column: HALO 90 Å C18, 5 µm, 4.6 x 250 mm
Part Number: 95814-902
Mobile Phase:
A: Water
B: 80/20 ACN/THF
Gradient: Hold at 45% B for 5 min
45-95% B from 5-20 min
Flow Rate: 1.5 mL/min
Pressure: 223 bar
Temperature: 30 °C
Detection: UV 360 nm
Injection Volume: 2.0 µL
Sample Solvent: 50/50 ACN/water
Response Time: 0.12 sec
Flow Cell: 5.0 µL semi-micro, bypassed
LC System: Agilent 1100 Series Quaternary

STRUCTURES: