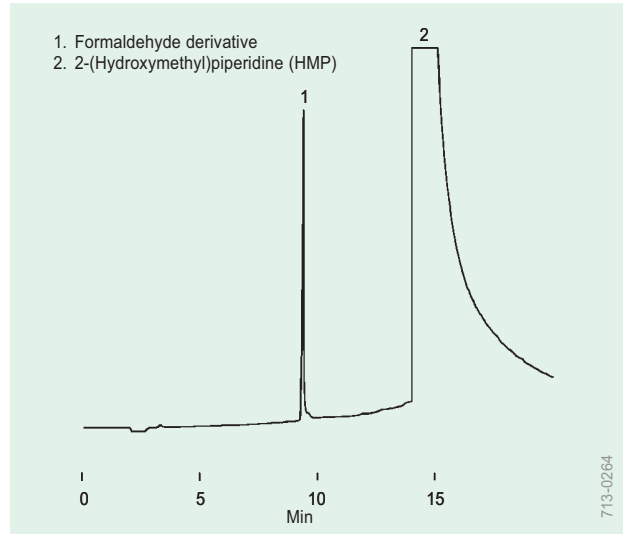
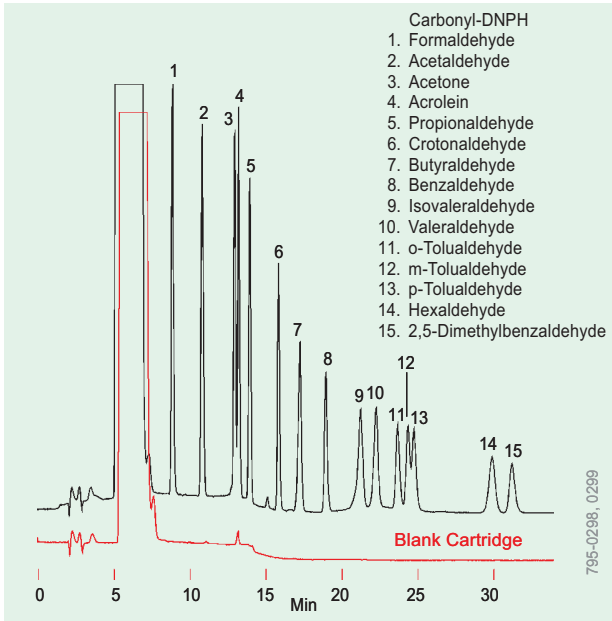


# Sample Preparation Applications

## Air Monitoring

Sample Preparation

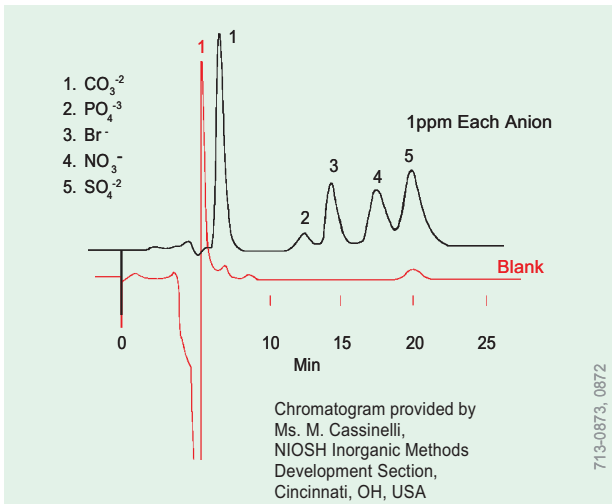


### Formaldehyde by OSHA Method 52 (GC)

Sample: HMP-coated Supelpak 20 spiked with formaldehyde (10µg)  
 Sampling Tube: ORBO-24  
 Cat. No.: 20231  
 Column: SUPELCO WAX 10, 30m x 0.53mm ID, 0.5µm film  
 Cat. No.: 25325  
 Oven: 50°C (2 min) to 200 °C at 10°C/min  
 Carrier: helium, 7mL/min  
 Det.: NPD, 220°C  
 Inj.: 1µL direct, 220 °C

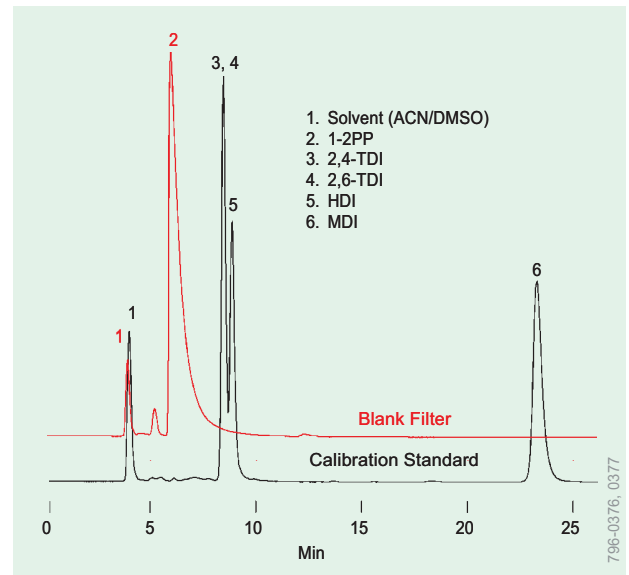
### Aldehydes/Ketones in Air by US EPA TO-11, IP-6A, ASTM D5197 (HPLC)

Sample: 5µg each carbonyl-DNPH on LpDNPH cartridge. Cartridge eluted with 5.0mL acetonitrile  
 Sampling Tube: LpDNPH Cartridge  
 Cat. No.: 21024  
 Column: SUPELCO SIL LC-18, 25cm x 4.6mm ID, 5µm particles  
 Cat. No.: 58298  
 Mobile Phase: A = acetonitrile:tetrahydrofuran:water, 30:10:60  
 B = acetonitrile:water, 60:40  
 0% B for 1 min, linear gradient to 100% B over 10 min  
 Flow Rate: 1.5mL/min  
 Det.: VIS, 360nm  
 Inj.: 25µL of extract



### Inorganic Acids by NIOSH Method 7903 (HPLC)

Sample: ORBO-53 tube spiked with inorganic acids (1ppm each component)  
 Sampling Tube: ORBO-53  
 Cat. No.: 20265  
 Column: Dionex S2 Fast Run Anion, 25cm x 3mm ID  
 Mobile Phase: 3mM NaHCO<sub>3</sub>/2.4mM Na<sub>2</sub>CO<sub>3</sub>  
 Flow Rate: 3.0mL/min  
 Det.: conductivity (10µSiemens/cm)



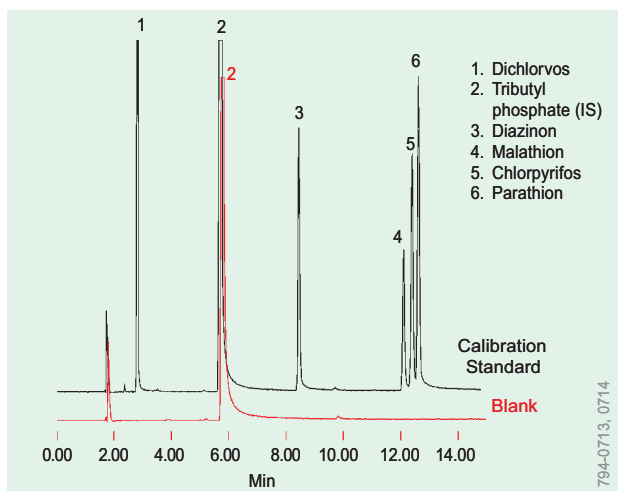
### Isocyanates by OSHA 42, 47, ASTM D5836 (HPLC)

Sample: calibration standard: isocyanate derivatives, 5µg/mL in acetonitrile  
 blank: 1-(2-pyridyl)piperazine (1-2PP) coated glass fiber filter desorbed in ACN/DMSO, 9:1  
 Sampling Tube: ORBO-80  
 Cat. No.: 20811  
 Column: SUPELCO SIL LC-8, 25cm x 4.6mm ID, 5µm particles  
 Cat. No.: 58297  
 Mobile Phase: 0.05M ammonium acetate in water:acetonitrile, 70:30 (pH 6-6.2 with acetic acid)  
 Flow Rate: linear gradient, 0.7/min to 2mL/min in 15 min  
 Det.: UV, 254nm  
 Inj.: 10µL

Order: 1.800.325.3010 Technical Service: 1.800.359.3041 Web: www.sigma-aldrich.com/supelco

## Sample Preparation Applications

### Air Monitoring



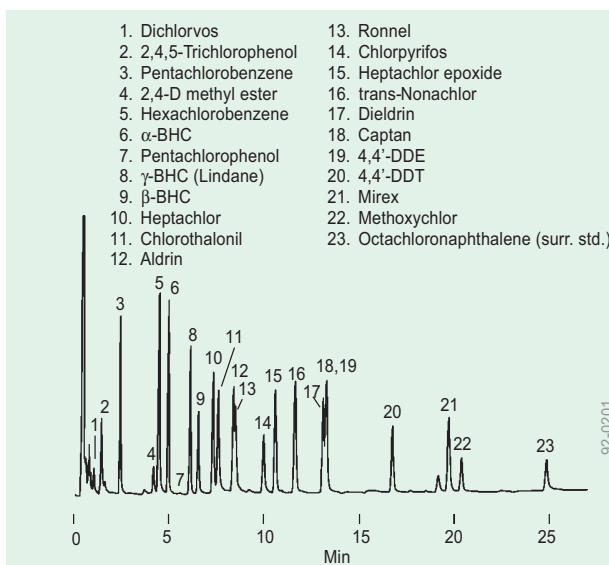
1. Dichlorvos
2. Tributyl phosphate (IS)
3. Diazinon
4. Malathion
5. Chlorpyrifos
6. Parathion

794-0713, 0714

#### Organophosphorus Pesticides by OSHA Method 62 (GC)

Sample: calibration standard: 12µg/mL each pesticide, 78µg/mL tributyl phosphate (int. std.) in toluene  
blank: 270mg Supelpak 20, glass fiber filter desorbed in toluene + 78µg/mL tributyl phosphate

Sampling Tube: ORBO-49P  
Cat. No.: 20350  
Column: SPB-20, 60m x 0.53mm ID, 1.0µm film (available on request)  
Oven: 200°C (2 min) to 250 °C at 4°C/min  
Carrier: helium, 8mL/min  
Det.: FPD, 300°C  
Inj.: 1µL, direct injection, 220 °C (packed column injector)

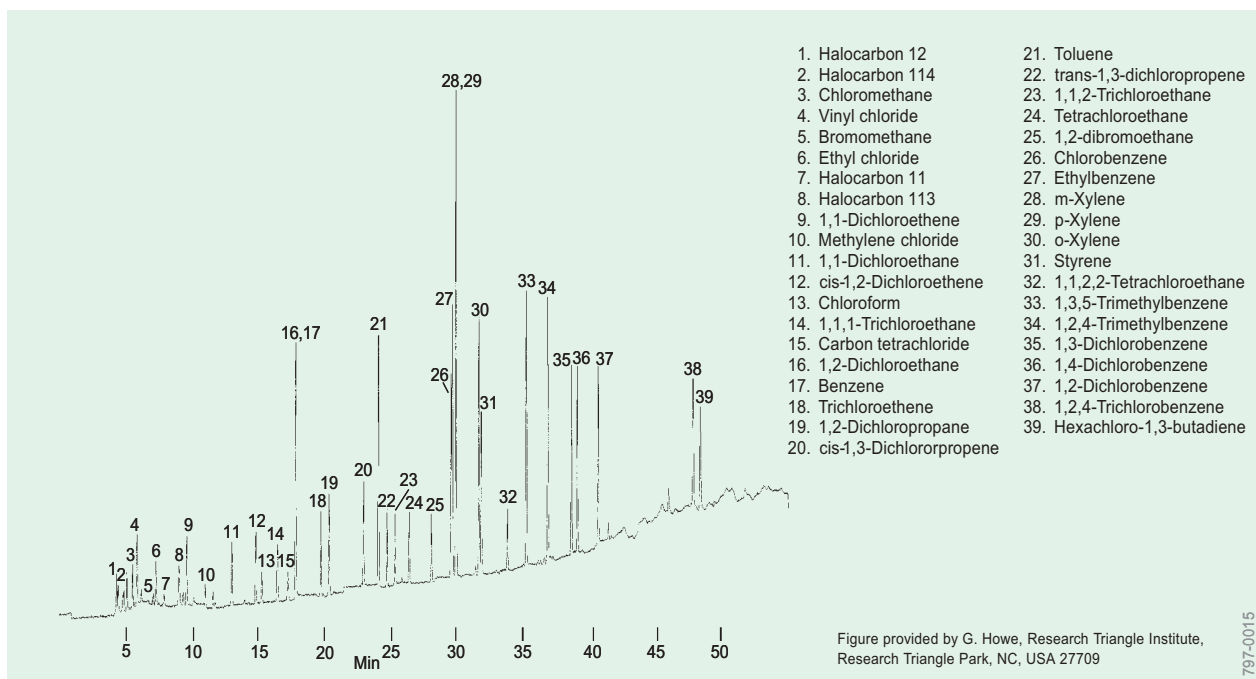


1. Dichlorvos
2. 2,4,5-Trichlorophenol
3. Pentachlorobenzene
4. 2,4-D methyl ester
5. Hexachlorobenzene
6. α-BHC
7. Pentachlorophenol
8. γ-BHC (Lindane)
9. β-BHC
10. Heptachlor
11. Chloroethalonil
12. Aldrin
13. Ronnel
14. Chlorpyrifos
15. Heptachlor epoxide
16. trans-Nonachlor
17. Dieldrin
18. Captan
19. 4,4'-DDE
20. 4,4'-DDT
21. Mirex
22. Methoxychlor
23. Octachloronaphthalene (surr. std.)

92-0201

#### Pesticides by US EPA Method IP-8, TO-10A, ASTM D4861 (GC)

Sample: polyurethane foam (PUF) spiked with 250ng each pesticide  
Sampling Tube: ORBO-1000  
Cat. No.: 20557  
Column: SPB-608, 30m x 0.53mm ID, 0.5µm film  
Cat. No.: 25312  
Oven: 150°C (1 min) to 270 °C at 4°C/min  
Carrier: helium, 7mL/min  
Det.: ECD  
Inj.: 1µL



1. Halocarbon 12
2. Halocarbon 114
3. Chloromethane
4. Vinyl chloride
5. Bromomethane
6. Ethyl chloride
7. Halocarbon 11
8. Halocarbon 113
9. 1,1-Dichloroethene
10. Methylene chloride
11. 1,1-Dichloroethane
12. cis-1,2-Dichloroethene
13. Chloroform
14. 1,1,1-Trichloroethane
15. Carbon tetrachloride
16. 1,2-Dichloroethane
17. Benzene
18. Trichloroethene
19. 1,2-Dichloropropane
20. cis-1,3-Dichloropropene
21. Toluene
22. trans-1,3-dichloropropene
23. 1,1,2-Trichloroethane
24. Tetrachloroethane
25. 1,2-dibromoethane
26. Chlorobenzene
27. Ethylbenzene
28. m-Xylene
29. p-Xylene
30. o-Xylene
31. Styrene
32. 1,1,2,2-Tetrachloroethane
33. 1,3,5-Trimethylbenzene
34. 1,2,4-Trimethylbenzene
35. 1,3-Dichlorobenzene
36. 1,4-Dichlorobenzene
37. 1,2-Dichlorobenzene
38. 1,2,4-Trichlorobenzene
39. Hexachloro-1,3-butadiene

Figure provided by G. Howe, Research Triangle Institute, Research Triangle Park, NC, USA 27709

797-0015

#### Volatile Organic Compounds by US EPA TO-17 (GC)

Adsorbent Tube: Air Toxics (glass) 10-50ng each analyte introduced onto tube (calibration standard, Cat. No. 41900)  
Cat. No.: 25086  
GC Column: VOCOL, 60m x 0.25mm ID, 1.5µm film  
Cat. No.: 24154  
Oven: 37°C (4 min) to 200 °C at 4°C/min, hold 10 min  
Carrier: helium, 2mL/min  
Det.: FID

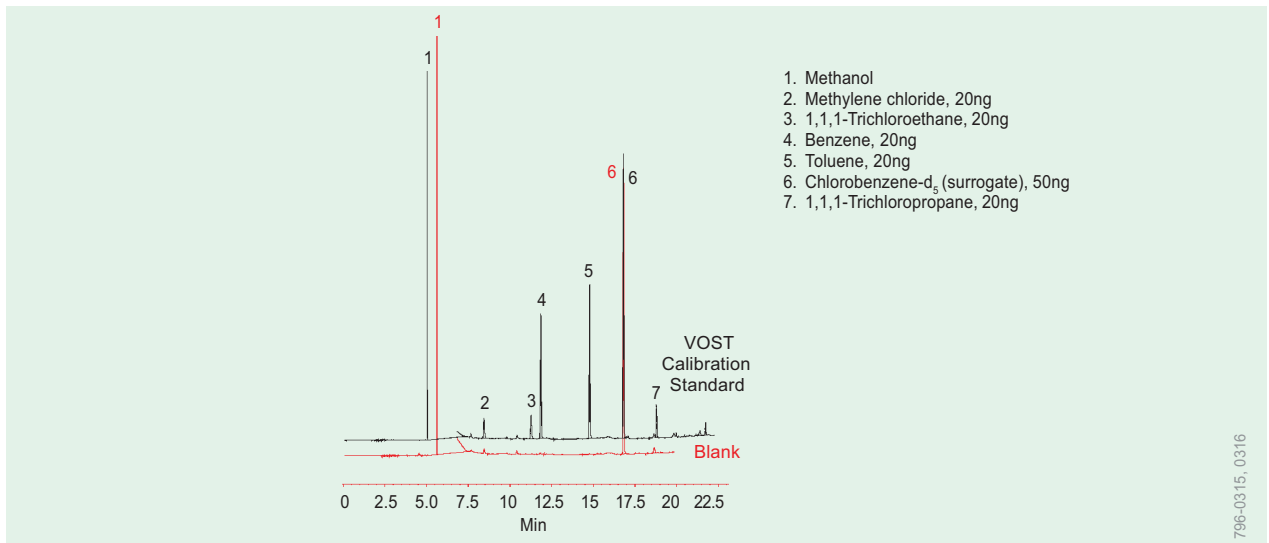
Order: 1.800.325.3010 Technical Service: 1.800.359.3041 Web: [www.sigma-aldrich.com/supelco](http://www.sigma-aldrich.com/supelco)

Sample  
Preparation

SUPELCO

## Sample Preparation Applications

### Air Monitoring



796-0315\_0316

#### Volatile Compounds by US EPA Method 0030 (VOST) (GC)

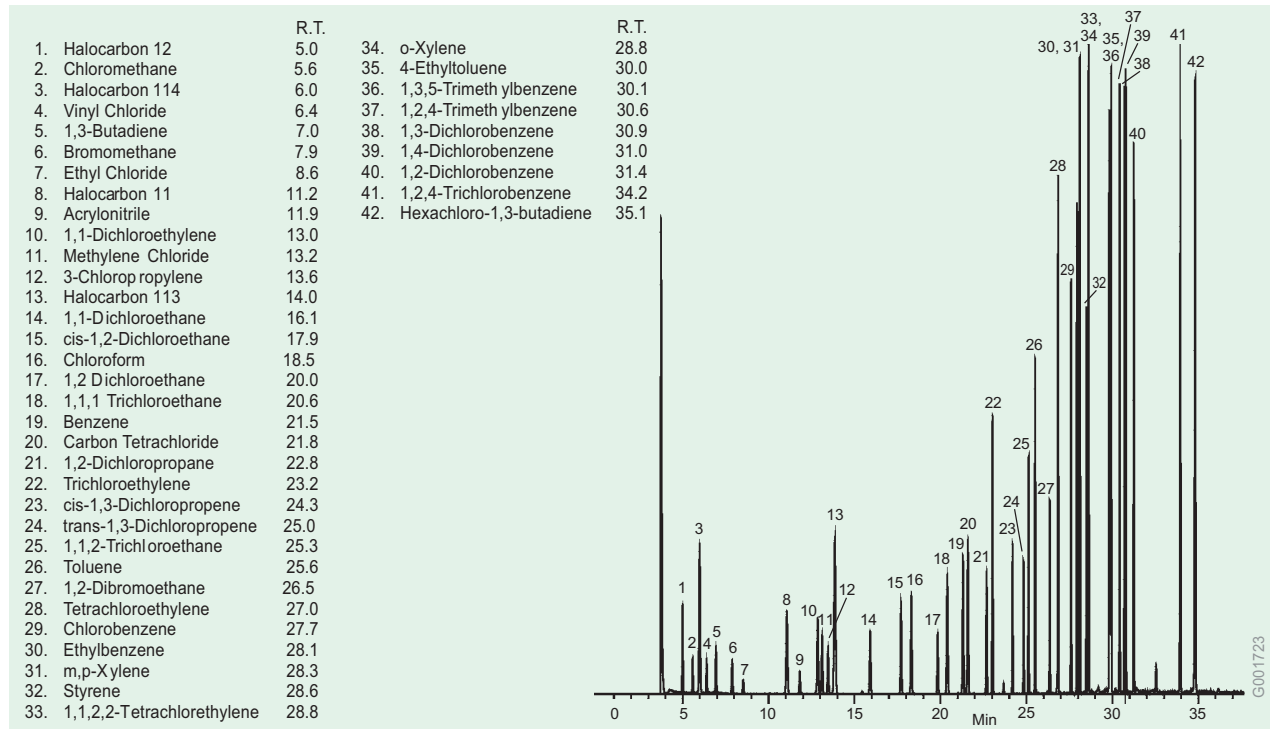
Sample: calibration standard: volatiles in methanol; blank: Tenax TA tube with surrogate thermally desorbed into purge & trap system

Sampling Tube: VOST 100  
Cat. No.: 20074

Purge Trap: VOCARB 4000  
Cat. No.: 20308

Column: SPB-624, 75m x 0.53mm ID, 3.0µm film

Cat. No.: 25432  
Oven: 35°C (5 min) to 200 °C at 10°C/min, hold 2 min  
Carrier: helium, 8mL/min  
Det.: FID, 300°C



G001723

#### Volatiles in Air by Thermal Desorption (GC)

Sample: 20mL JHAP-43 Gas Mix Cat. No. 500429  
(1ppm each component)

##### Thermal Desorption

Thermal Desorber: GERSTEL TDS A  
Sampling Tube: Carbotrap 300  
Cat. No.: 28283-U  
Tube Desorption Temp: 330°C, 6 min  
Tube Desorption Flow: 20mL/min, Cryo-Focused to CIS-4 Inlet at -150°C

##### Chromatography

Column: SPB-1, 60m x 0.25mm ID, 3.0µm film  
(available on request)  
Oven: 35°C (8.00 min) to 100°C at 5°C/min, hold 0 min,  
230°C at 15°C/min hold 8 min  
Carrier: helium 31cm/sec  
Det: MS, scan range 35 to 269amu