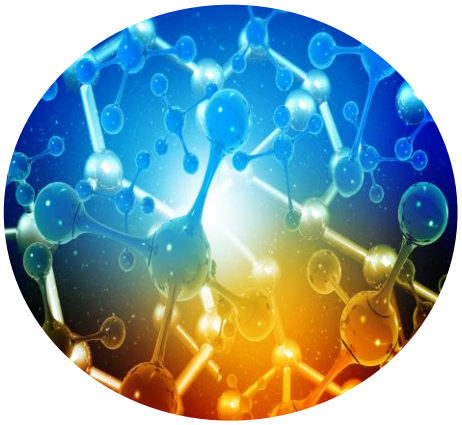


Use of Verex™ Filter Vials for PCB Separation by GC-MS using Zebron™ ZB-Dioxin GC Columns

Zara Jalali, Ramkumar Dhandapani, Jenks Presley, and Dr. Bryan Tackett
Phenomenex, Inc., 411 Madrid Ave., Torrance, CA 90501 USA

Overview

Preparation of samples can be done in a variety of ways, which can ultimately affect the sample injected into the system and the observed results. Ineffective sample preparation can lead to many problems including reduction in chromatographic separation efficiency and sample reproducibility. Inappropriate choice of preparation devices could release extractable compounds into the sample, introducing errors through sample loss, which would influence the quality and reproducibility of the obtained results.

In this application, Polychorinated Biphenyls (PCBs) were prepared and filtered using Verex Filter Vials and Phenex™ syringe filters. GC-MS was performed to determine if there was a loss of sample by using the Verex Filter Vials. When compared to the PCBs without a filtration device, the PCBs filtered with either the syringe filter or the Verex Filter Vial showed similar results.

GC-MS Conditions

Column: Zebron ZB-Dioxin
Dimension: 60 meter x 0.25 mm x 0.20 µm
Part No.: 7KG-G045-10
Injection: Splitless @ 280 °C, 1 µL
Recommended Liner: Zebron PLUS Single Taper Z-Liner™ (for Agilent® systems)
Liner Part No.: AG2-0A13-05 (for Agilent systems)
Carrier Gas: Helium @ 2.0 mL/min (constant flow)
Oven Program: 100 °C for 2 mins,
300 °C @ 6 °C/min for 5 min
Detector: GC-MS

#	CID	Analyte Name
1	PCB 31	2,4',5-Trichlorobiphenyl
2	PCB 28	2,4,4'-Trichlorobiphenyl
3	PCB 69	2,3',4,6-Tetrachlorobiphenyl
4	PCB 52	2,2',5,5'-Tetrachlorobiphenyl
5	PCB 70	2,3',4',5-Tetachlorobiphenyl
6	PCB 101	2,2',4,5,5'-Pentachlorobiphenyl
7	PCB 81	3,4,4',5-Tetrachlorobiphenyl
8	PCB 77	3,3',4,4'-Tetrachlorobiphenyl
9	PCB 123	2',3,4,4',5-Pentachlorobiphenyl
10	PCB 118	2,3',4,4',5-Pentachlorobiphenyl
11	PCB 153	2,2',4,4',5,5'-Hexachlorobiphenyl
12	PCB 105	2,3,3',4,4'-Pentachlorobiphenyl
13	PCB 164	2,3,3',4',5',6-Hexachlorobiphenyl
14	PCB 163	2,3,3',4',5,6-Hexachlorobiphenyl
15	PCB 138	2,2',3,4,4',5'-Hexachlorobiphenyl
16	PCB 126	3,3',4,4',5-Pentachlorobiphenyl
17	PCB 167	2,3',4,4',5,5'-Hexachlorobiphenyl
18	PCB 156	2,3,3',4,4',5-Hexachlorobiphenyl
19	PCB 157	2,3,3',4,4',5'-Hexachlorobiphenyl
20	PCB 180	2,2',3,4,4',5,5'-Heptachlorobiphenyl
21	PCB 169	3,3',4,4',5,5'-Hexachlorobiphenyl
22	PCB 170	2,2',3,3',4,4',5-Heptachlorobiphenyl
23	PCB 189	2,3,3',4,4',5,5'-Heptachlorobiphenyl

Sample Preparation

Mix:	100 µL of each 100 µg/mL PCB Standard and bring to final volume of 2.5 mL with Isooctane Final concentration of 4 µg/mL PCB mixture
Take:	1 mL (unfiltered or syringe filter) or 0.5 mL (Verex Filter Vial) of 4 µg/mL PCB mixture
Load:	Sample into Verex Filter Vial 0.45 µm, PTFE (AR0-F202-12) or syringe filter Phenex syringe 0.45 µm, 4 mm PTFE (AF0-3102-12)
Inject:	1 µL filter eluate onto GC-MS

Figure 1. Zebron™ ZB-Dioxin separation of PCBs without filtration.

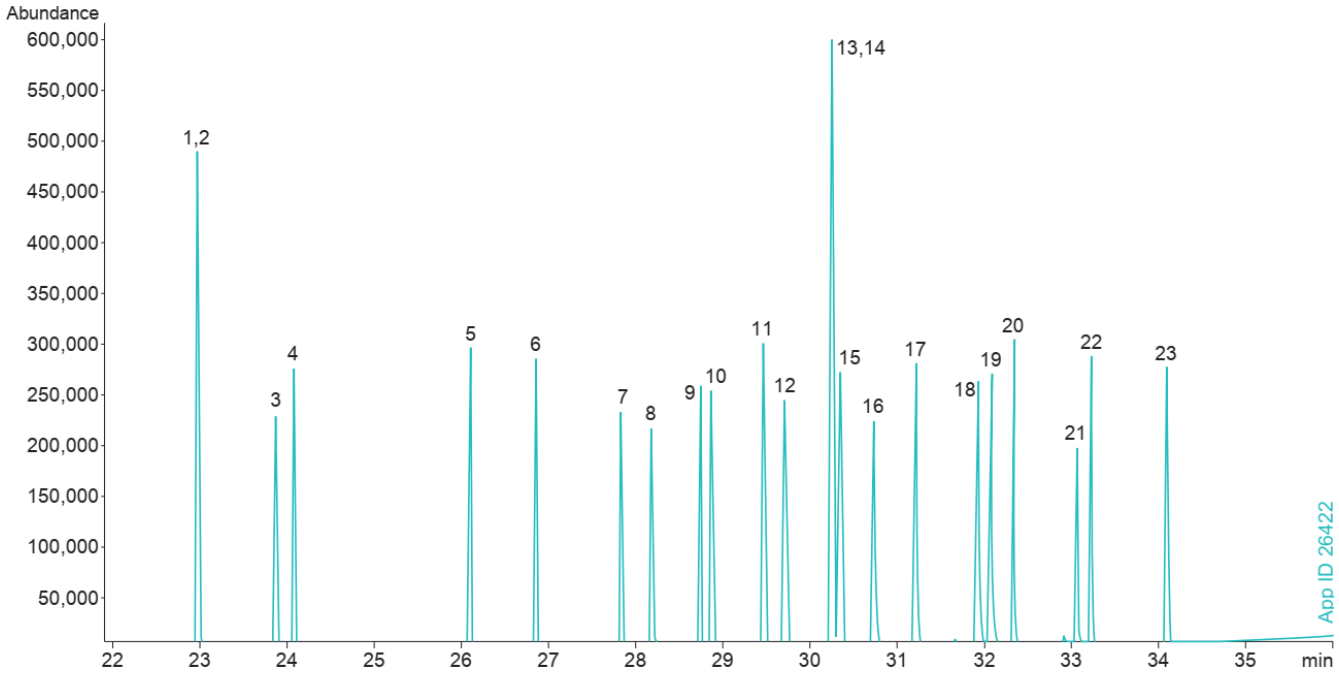


Figure 2. Zebron ZB-Dioxin separation of PCBs with the use of a Verex™ Filter Vial.

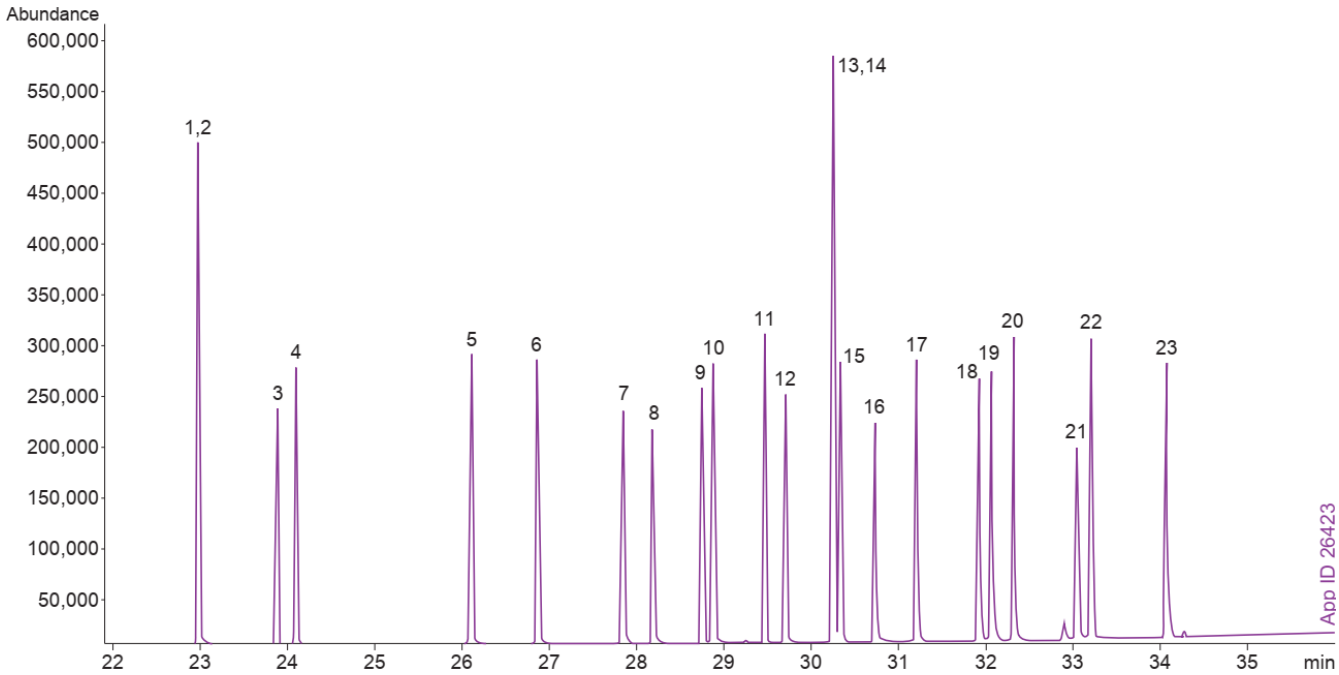


Figure 3. Zebron™ ZB-Dioxin separation of PCBs with the use of a Phenex™ syringe filter.

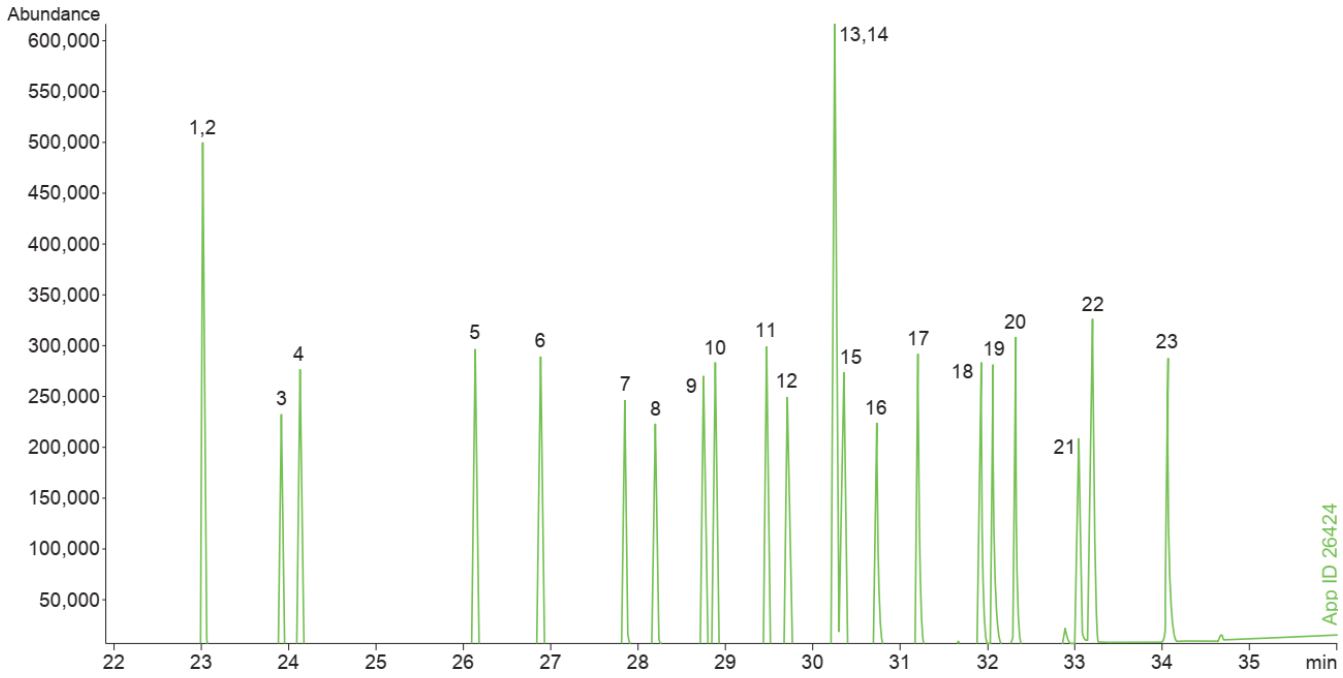
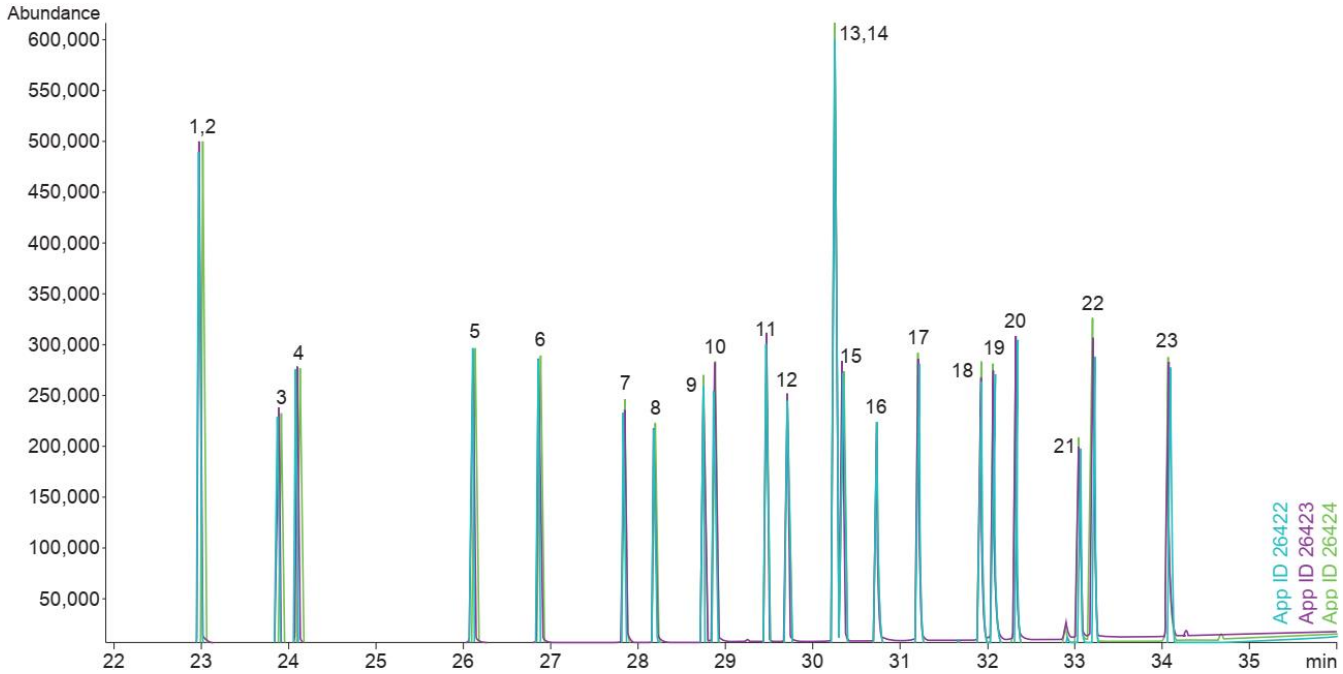


Figure 4. Overlay of all chromatograms.



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auinfo@phenomenex.com

Austria
t: +43 (0)1-319-1301
anfrage@phenomenex.com

Belgium
t: +32 (0)2 503 4015 (French)
t: +32 (0)2 511 8666 (Dutch)
beinfo@phenomenex.com

Canada
t: +1 (800) 543-3681
info@phenomenex.com

China
t: +86 400-606-8099
cninfo@phenomenex.com

Czech Republic
t: +420 272 017 077
cz-info@phenomenex.com

Denmark
t: +45 4824 8048
nordicinfo@phenomenex.com

Finland
t: +358 (0)9 4789 0063
nordicinfo@phenomenex.com

France
t: +33 (0)1 30 09 21 10
franceinfo@phenomenex.com

Germany
t: +49 (0)6021-58830-0
anfrage@phenomenex.com

Hong Kong
t: +852 6012 8162
hkinfo@phenomenex.com

India
t: +91 (0)40-3012 2400
indiainfo@phenomenex.com

Indonesia
t: +62 21 5010 9707
indoinfo@phenomenex.com

Ireland
t: +353 (0)1 247 5405
eireinfo@phenomenex.com

Italy
t: +39 051 6327511
italiainfo@phenomenex.com

Japan
t: +81 (0) 120-149-262
jpinfo@phenomenex.com

Luxembourg
t: +31 (0)30-2418700
nlinfo@phenomenex.com

Mexico
t: 01-800-844-5226
tecnicomx@phenomenex.com

The Netherlands
t: +31 (0)30-2418700
nlinfo@phenomenex.com

New Zealand
t: +64 (0)9-4780951
nzinfo@phenomenex.com

Norway
t: +47 810 02 005
nordicinfo@phenomenex.com

Poland
t: +48 22 104 21 72
pl-info@phenomenex.com

Portugal
t: +351 221 450 488
ptinfo@phenomenex.com

Singapore
t: +65 800-852-3944
sginfo@phenomenex.com

Slovakia
t: +420 272 017 077
sk-info@phenomenex.com

Spain
t: +34 91-413-8613
espinfo@phenomenex.com

Sweden
t: +46 (0)8 611 6950
nordicinfo@phenomenex.com

Switzerland
t: +41 (0)61 692 20 20
swissinfo@phenomenex.com

Taiwan
t: +886 (0) 0801-49-1246
twinfo@phenomenex.com

Thailand
t: +66 (0) 2 566 0287
thaiinfo@phenomenex.com

United Kingdom
t: +44 (0)1625-501367
ukinfo@phenomenex.com

USA
t: +1 (310) 212-0555
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All other countries/regions
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