

# APPLICATIONS

## GC-HRMS Analysis of Tetra through Octa Dioxins and Furans on Zebtron™ ZB-Dioxin GC Columns

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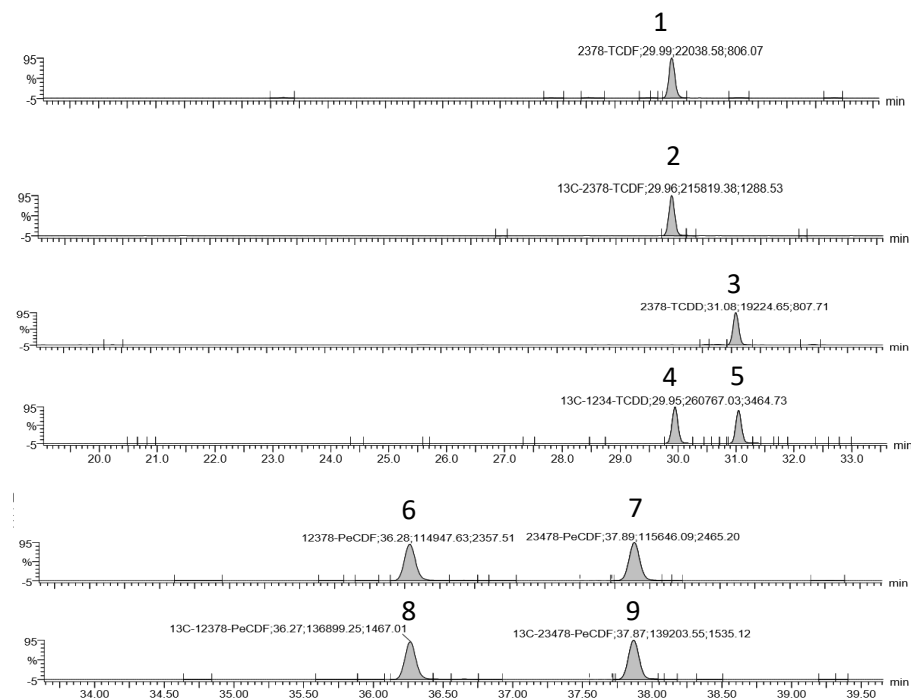
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### Overview

Dioxins are Persistent Organic Pollutants (POPs) generated that are continuously monitored in food as well as environmental samples. Common methods for monitoring dioxins include EPA-1613, EPA-8290, EN-1948-1, and EN-1948-2. EPA method 1613 specifies the use of two GC phases, namely 5% phenyl phase and 50%-Cyanopropylphenyl-dimethylpolysiloxane (225 column). With Zebtron ZB-Dioxin, the critical tetra dioxins and furans are separated in a single run without the necessity for a secondary column. Presented in **Figure 1, 2 and 3** is the separation of tetra through octa dioxins and furans from each other and from their <sup>13</sup>C & <sup>37</sup>Cl isotopically labeled form by GC-HRMS. The high efficiency and selectivity of ZB-Dioxin provides enhanced resolution for tetra through octa dioxin isomers on a single GC column.

**Figure 1: Tetra through Penta Dioxins and Furans and its labeled isomer Separation**



### GC-HRMS Conditions for all applications:

**Column:** Zebtron ZB-Dioxin

**Dimension:** 60 meter x 0.25 mm x 0.20 μm

**Part No.:** [7KG-G045-10](#)

**Recommended Z-Guard™:** [7AG-G000-00-GZK](#)

**Injection:** Pulse Splitless (2.0 min @ 60 psi) @ 280 °C, 1 μL

**Recommended Liner:** Zebtron PLUS Single Taper

**Liner Part No.:** [AG2-0A10-05](#) (for Agilent® systems)

**Carrier Gas:** Helium @ 1.25 mL/min (constant flow)

**Oven Program:** 160 °C for 2.4 min, 200 °C @ 25 °C/min, 220 °C @ 5 °C/min for 19 min, 288 °C @ 4 °C/min, 300 °C @ 5°C/min for 7.6 min

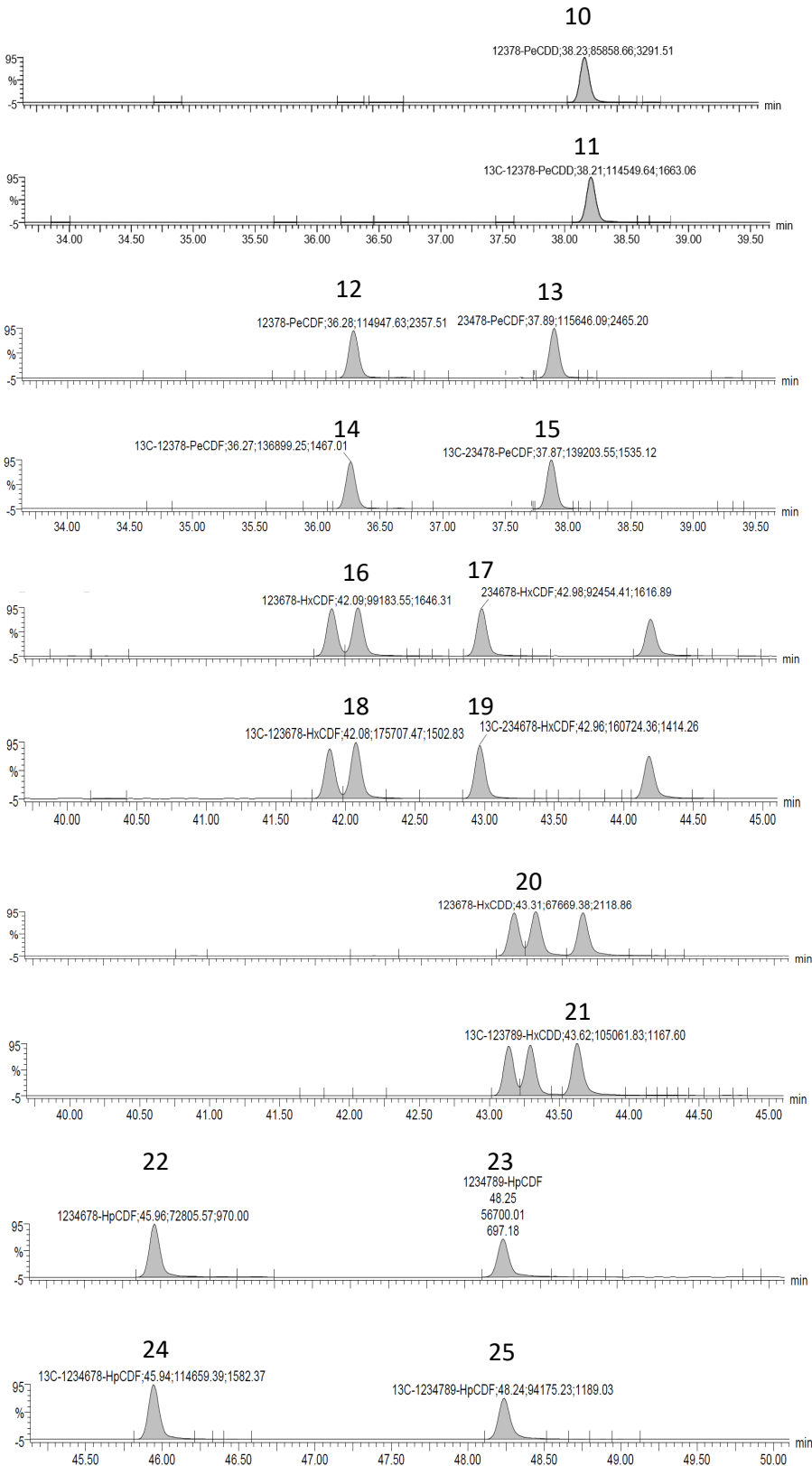
**Detector:** GC-HRMS

**Transfer Line Temperature:** 300 °C

- Sample:**
1. 2,3,7,8-TCDF
  2. <sup>13</sup>C-2,3,7,8-TCDF
  3. 2,3,7,8-TCDD
  4. <sup>13</sup>C-1,2,3,4-TCDD
  5. <sup>13</sup>C-2,3,7,8-TCDD
  6. 1,2,3,7,8-PeCDF
  7. 2,3,4,7,8-PeCDF
  8. <sup>13</sup>C-1,2,3,7,8-PeCDF
  9. <sup>13</sup>C-2,3,4,7,8-PeCDF
  10. 1,2,3,7,8-PeCDD
  11. <sup>13</sup>C-1,2,3,7,8-PeCDD
  12. 1,2,3,7,8-PeCDF
  13. 2,3,4,7,8-PeCDF
  14. <sup>13</sup>C-1,2,3,7,8-PeCDF
  15. <sup>13</sup>C-2,3,4,7,8-PeCDF
  16. 1,2,3,6,7,8-HxCDF
  17. 2,3,4,6,7,8-HxCDF
  18. <sup>13</sup>C-1,2,3,6,7,8-HxCDF
  19. <sup>13</sup>C-2,3,4,6,7,8-HxCDF
  20. 1,2,3,6,7,8-HxCDD
  21. <sup>13</sup>C-1,2,3,6,7,8-HxCDD
  22. 1,2,3,4,6,7,8-HpCDF
  23. 1,2,3,4,7,8,9-HpCDF
  24. <sup>13</sup>C-1,2,3,4,6,7,8-HpCDF
  25. <sup>13</sup>C-1,2,3,4,7,8,9-HpCDF
  26. 1,2,3,4,6,7,8-HpCDD
  27. <sup>13</sup>C-1,2,3,4,6,7,8-HpCDD
  28. OCDF
  29. OCDD
  30. <sup>13</sup>C-OCDD
  31. <sup>37</sup>Cl-2,3,7,8-TCDD

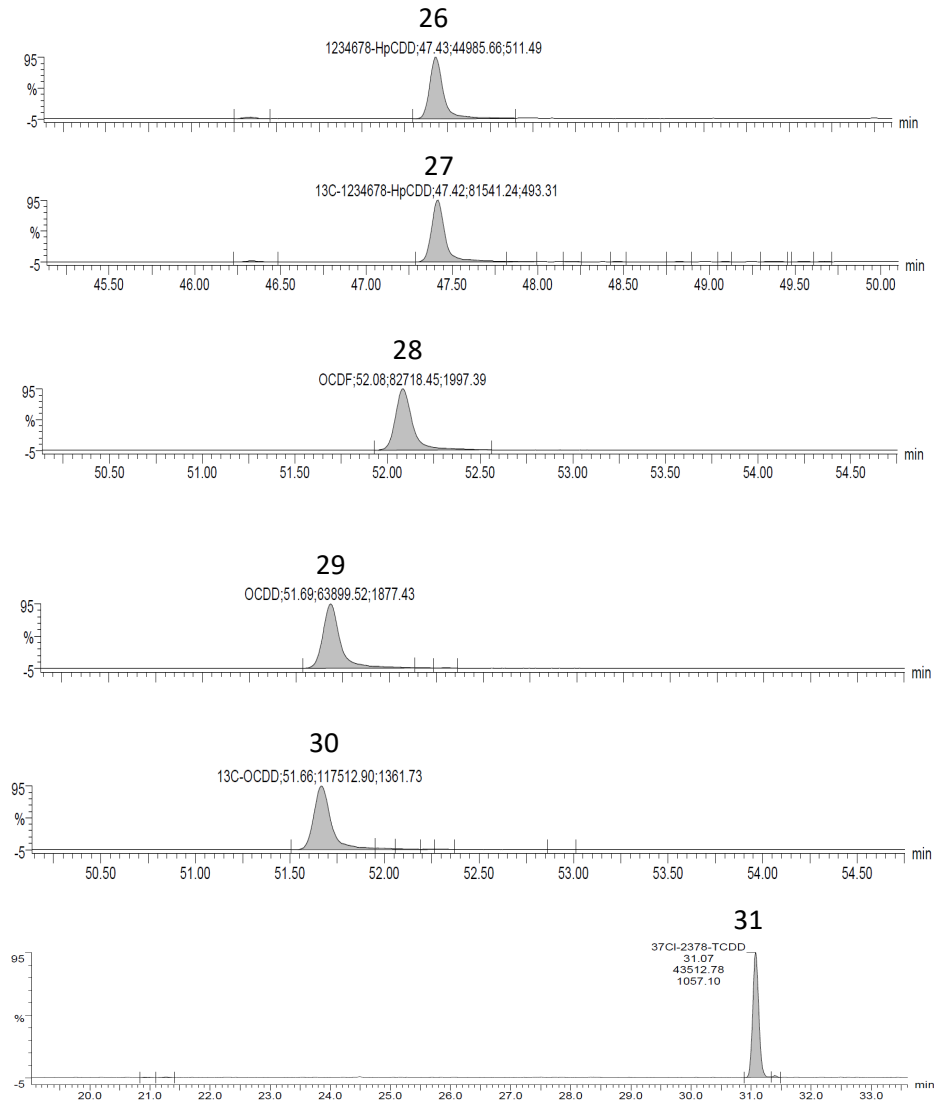
App ID 26014

**Figure 2: Penta through Hexa Dioxins and Furans and its labeled isomer Separation**



App ID 26073

**Figure 3: Hepta through Octa Dioxins and Furans and its labeled isomer Separation**



App ID 26074

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