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#096

EPA TO1 Analysis using the CDS TDA 9300 Autosampler

In our highly technological age volatile emissions occur from a variety of sources. Included in this list are industrial sites, commercial facilities, and hazardous waste storage. Many of the emissions that emanate from these sites have been catagorized as toxic. The toxicity of of these compounds makes it imperative that a qualitative and quantitative knowledge of them be known. Prolonged exposure to these compounds can seriously impact human health.

TO-1 compound determinations are based upon polarity as well as boiling point. The TO-1 analysis is for nonpolar compounds with a boiling point range of 80°C-200°C.

A quantitative standard of TO-1 compounds in methanol was purchased. The concentration of the stock standard was 2000µg/ml. An appropriate dilution was made to give a concentration of 25ng/µl as a working standard. Multibed sampling tubes consisting of Tenax TA, Carboxen 1000, and Carbosieve SIII were spiked with the TO-1 working standard of concentrations of 25,50,75,100, 150,and 200ng respectively. Each concentration was run in triplicate. The spiked sampling tubes were thermally desorbed on the TDA 9300 at 225°C for 5 minutes. The trap was desorbed at 250°C for 2.5 minutes. The TDA 9300 was interfaced to a GC/Mass Spectrometer. Figure 1 is a qualitative plot of the TO-1 standard. Figure 2 shows an area /nanogram plot of benzene. The correlation coefficient is 0.997.

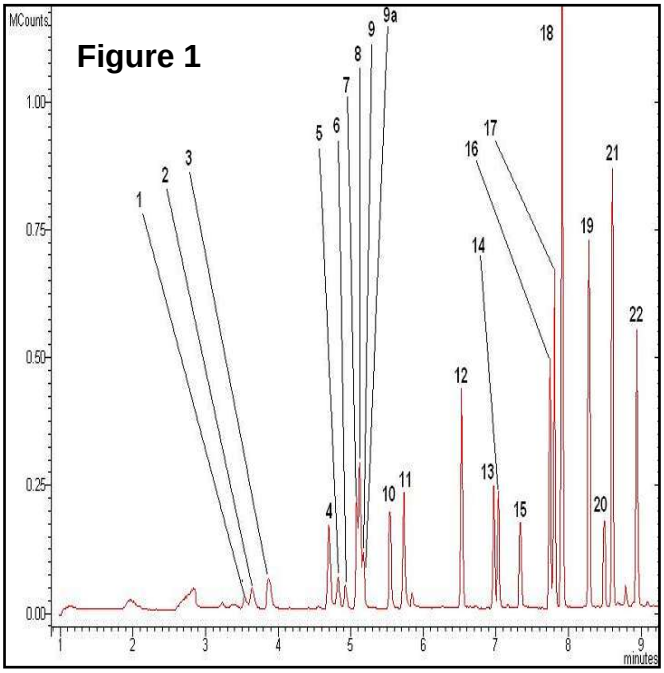

Figure 1

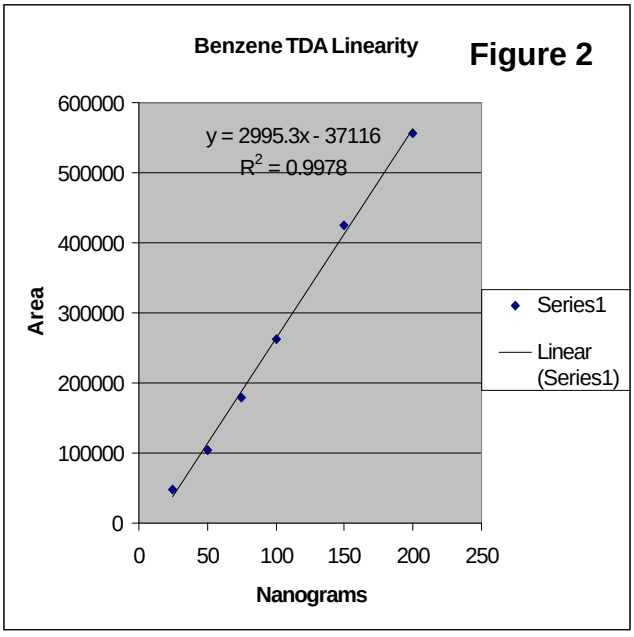

Figure 2

Equipment

Multibed packed Dynatherm tubes were spiked with the TO-1 standard mixture at various concentrations. The spiked tubes were thermally desorbed using the TDA 9300 interfaced to a ACEM 9300 . This instrument in turn was interfaced to a GC, and a mass spectometer was used as the detector.

TDA 9300/ACEM 9300 Conditions

Valve Oven:	250°C
Transfer Line:	250°C
Dry Tube:	35°C/1min
Tube Heat:	225°C/2.5min
Trap Heat:	250°C/5min
Aux1:	300°C

GC/MS Conditions

Carrier:	Helium
Column:	CP-Select 624 (30M x .25mm x 1.4 µm)
Detector:	Mass Spectrometer
Split:	Initial 20, 0.01 minute 5, 2.00 minutes 40

GC Program:
Initial: 30°C/1.5min
Ramp: 15°C/min
Final: 220°C

Figure 1 Compound Identification

1. Allyl Chloride
2. Methylene Chloride
3. Acrylonitrile
4. Chloroform
5. 1,1,1-Trichloroethane
6. Carbon Tetrachloride
7. Benzene
8. 1,2-Dichloroethane
9. Heptane
10. Trichloroethylene
11. 1,2-Dichloropropane
12. Toluene
13. Tetrachloroethylene
14. 1,3-Dichloropropane
15. 1,2-Dibromoethane
16. Chlorobenzene
17. Ethyl Benzene
18. o, m-Xylene
19. p-Xylene
20. Tribromoethane
21. Isopropylbenzene
22. Bromobenzene

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