

CDSolutions

APPLICATIONS INFORMATION USING ADVANCED SAMPLE HANDLING TECHNOLOGY

Drywall Contaminants Using the CDS TDA 9300 Thermal Desorption Autosampler

The Consumer Products Safety Commission (CPSC) reported recently (12/08) numerous complaints detailing malodorous smells coming from drywall. Coupled with these smells were complaints about headaches, throat irritation and other symptoms. A number of complaints also cited corrosion of metal items within the home. One area of interest was the possibility of imported drywall from China being a source of these odors.

Samples of both domestic and Chinese drywall were obtained. The samples evaluated had their paper backing as well as their painted paper surfaces removed using an Exacto knife. Each sample was reduced to a fine powder with a mortar and pestle. Samples weighing ~250 mg were placed into individual test tubes (13 mm x 100 mm) and then into individual headspace stations on the CDS TDA 9300 Autosampler. The autosampler was interfaced to the Agilent 6890 Gas Chromatograph. The Agilent 5975 MSD was used as the detector. Each sample was thermally desorbed at 300°C for 5 minutes and collected on a standard Tenax 6 mm focusing trap. The trap was desorbed at 300°C for 5 minutes.

Figure 1 shows the total ion chromatogram of the drywall sample from China. Significant amounts of sulfur compounds were found, including: Sulfur Dioxide, two Alkyl Thiols, and Cyclic Hexa and Octa Elemental Sulfur. Figure 2 is a ion chromatogram of a domestic drywall. Examination of this chromatogram shows no detectable elemental sulfur or sulfur compounds. Domestic drywall is comprised basically of the dihydrate of calcium sulfate and silicon dioxide. A number of alkenes and an alkyl aldehyde were detected. The origin and former storage of this drywall sample is unknown, hence these artifacts may well be adsorbed impurities.

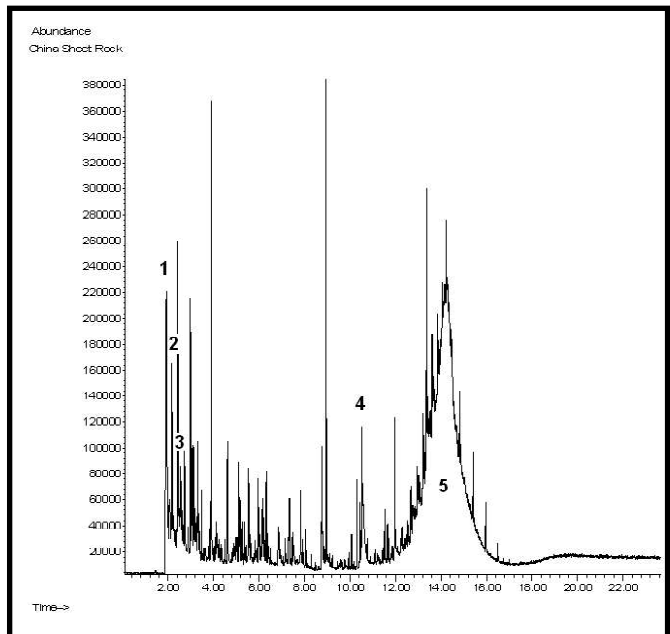


Figure 1. Chinese drywall.

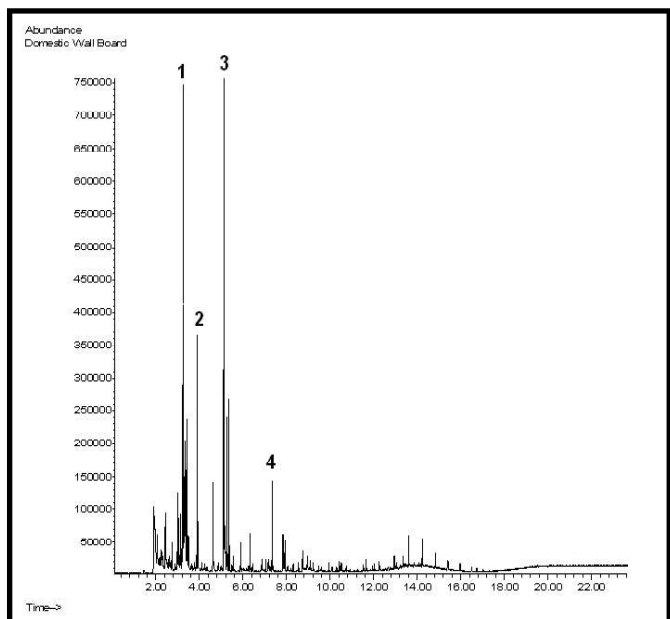


Figure 2. Domestic drywall.

Figure 1

1. Sulfur Dioxide
2. 2-Propanethiol
3. 2-Butanethiol
4. Cyclic Hexa-atomic Sulfur
5. Cyclic Octa-atomic Sulfur

Figure 2

1. 1-Octene
2. 2,5-Dimethyl-2,4-Hexadiene
3. 1-Decene
4. 1-Decanal

CDS 9300 TDA Conditions

Valve Oven:	300°C	
Transfer Line:	300°C	
Tube Idle:	40°C	
Dry Tube:	0°C	0 minutes
Tube Heat:	300°C	5 minutes
Tube Cool:		1 minutes
Trap Idle:	40°C	
Trap Heat:	300°C	5 minutes

Interconnect Line: 300°C

GC Conditions

Carrier:	Helium
Column:	VF 5MS (30 m x 0,25 mm x 0.25 µm)
Detector:	MSD
GC Program:	40°C/0 min, 15°C/min to 320°C 320°C/5 min



Figure 3: Thermal Desorption Autosampler with 8 mm sample tubes and Dynamic Headspace Stations

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