

Thermal Desorption of Drywall Contaminants

Application Note

Environment

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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 of about 250 mg were placed into individual empty thermal desorption tubes. Each tube was thermally desorbed at 300°C for 5 minutes and collected on a standard Tenax 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.

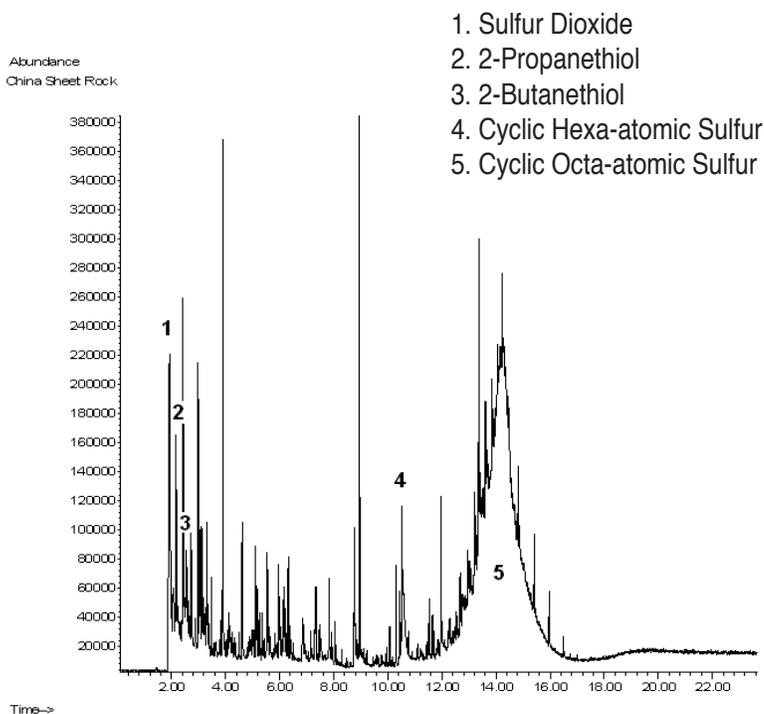


Figure 1. Chinese drywall.

CDS Autosampler Dynatherm 9300

Valve Oven: 300°C
Transfer Line: 300°C
Tube Heat: 300°C 5 minutes
Trap Heat: 300°C 5 minutes

When using an empty thermal desorption tube for "headspace" analysis, it is important to not heat a sample past its melting point.

GC/MS

Column: 5% Phenyl methyl silicone
30m x 0.25 mm
Carrier: Helium, 50:1 split
Injector: 350°C
Program: 40°C for 2 min
15°C/min to 320°C hold 5 min

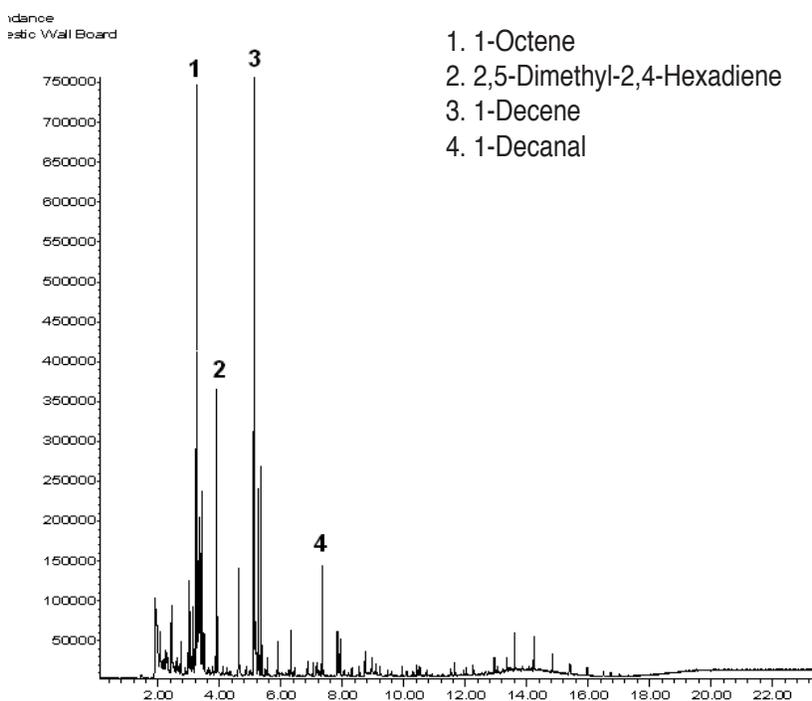


Figure 2. Domestic drywall.