

## Thermal Desorption of Gasoline Range Hydrocarbons from Soil using a Pyroprobe

### Application Note Environment

#### Author:

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Soil may be screened easily for contamination by placing a small sample into a quartz tube and using the Pyroprobe coil filament to desorb the organics from the soil matrix. Care must be taken not to heat the soil to a temperature high enough that the natural organic content is pyrolyzed and produces volatiles that complicate the analysis. In this example, it was determined that at 300°C, the soil organics produced volatiles, including furans and phenolics, but at 200°, the soil blank was relatively clean.

Figure 1 shows the result of heating 20 mg of dry soil to 200°C, after hydrocarbons had been added to make the total concentration 100 PPM. Sample preparation consisted only of weighing the sample and then transferring it to a quartz tube using a mini-vacuum pump. The soil was placed in the center half of the tube, and held in place using plugs of quartz wool. The quartz tube was then placed into the coil of the Pyroprobe, and heated in the interface of the Pyroprobe. The resulting volatilized hydrocarbons were collected onto the sorbent trap before desorption to the GC.

Figure 2 shows a blank run of the same soil without the added hydrocarbons, at 200°C. A few small peaks are seen at this temperature, which also are present in the run of the contaminated soil, but they do not mask or interfere with the identification of the hydrocarbons resulting from the contamination.

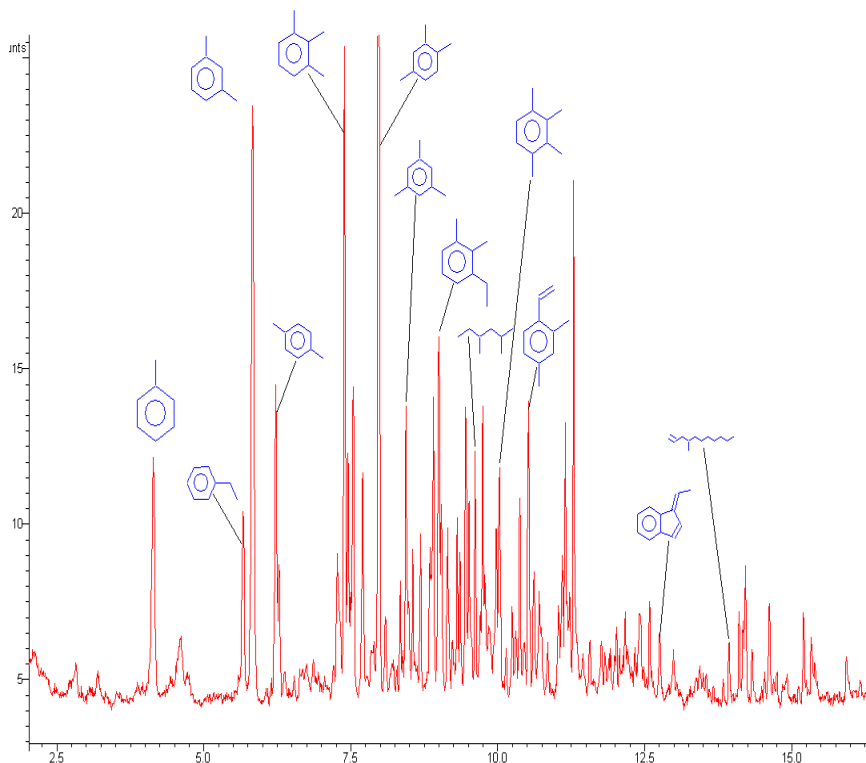


Figure 1. Hydrocarbon (100ppm) Spiked Soil Desorbed at 200°C.

## Instrument Conditions

### Pyroprobe

Filament: 200°C 30 seconds  
Interface: 200°C for 4 minutes  
Trap desorption: 325°C for 4 minutes

Valve Oven: 325°C  
Transfer Line: 325°C

### GC/MS

Column: 5% phenyl (30m x 0.25mm x 0.25µm)  
Carrier: Helium, 50:1 split  
Inlet: 300°C  
Oven: 40°C for 2 minutes  
10°C/min to 300°C  
Mass Range: 35-600 amu

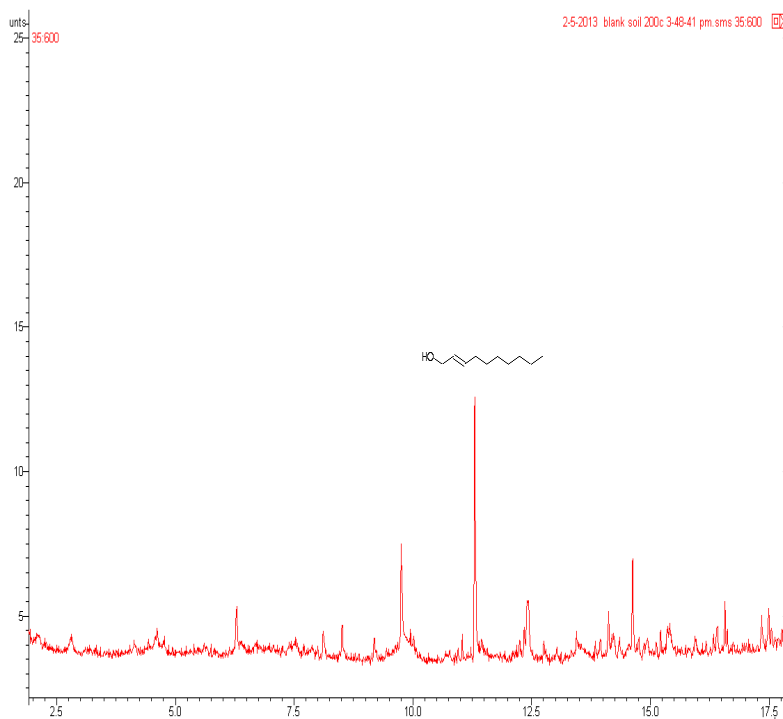


Figure 2. Blank (not spiked) soil at 200°C.

FOR MORE INFORMATION CONCERNING THIS APPLICATION,  
WE RECOMMEND THE FOLLOWING READING:

D. White and L. Beyer, J. Anal. Appl. Pyrolysis, 50 (1999) 63-76.