

So How Does Thermal Desorption Work for VOC Analysis

Thermal Desorption is a common sampling technique used for Volatile Organic Compound (VOC) analysis. The equipment needed is a low-flow pump and a sample tube filled with a non-toxic sorbent material. The types of sorbent material used are carefully selected to have absorbency for the VOC of interest. Tenax®, graphitized carbon, and carbon molecular sieve are examples of some common sorbent materials. During sampling the pump is used to draw air from the room through the sample tube. As the air passes over the sorbent the chemical compounds (VOC's) "stick" inside the sorbent particles removing them from the air. This process is very similar to how a water filter removes impurities from drinking water. If the flow rate of the pump is known and the length of time the pump was run to collect the sample then the volume of air sampled can be calculated (flow rate, L/min x sampling time, min = sample volume, L). The sample tube containing the collected chemicals is then sealed and shipped to an air testing laboratory for analysis.

Thermal desorption is a technique used by the laboratory to extract the chemicals from the sample tube. How thermal desorption works is the sample tube is heated inside of an analytical instrument causing the "stuck" chemicals to be released from the sorbent. If you think about drying a wet sponge in your oven the process is very similar. The released chemicals are then directed into an analytical instrument for analysis. Gas Chromatography with Mass Spectrometric detection is commonly used to identify and measure the mass of the VOC. Since the air volume (Liters, L) of the sample is known and the mass of each chemical (nanograms, ng) has been measured the results from the thermal desorption test are reported as ng/L. Analysis results are sent from the laboratory in a report outlining the overall VOC level present in the air that was sampled and any other specific chemical compound measurement results which were included in the air sample test that was purchased.

About Prism Analytical Technologies, Inc.

Prism Analytical Technologies, Inc. is a leading consultative air testing laboratory in the United States that is devoted to the chemical identification and analysis of contaminants in the air. We are a recognized leader in the development and deployment of ambient air testing methodologies for Fortune 100 and 500 companies, industrial hygienists, and environmental consultants. Prism's science-based technologies and wide range of air testing support help clients solve indoor air quality, process control, industrial, and environmental challenges.