



**AIR HYGIENE, INC.**



## **Why Air Hygiene FTIR Labs are the Solution for your Testing Needs!**

- Five (5) FTIR labs for formaldehyde, VOC's, & HAPS by EPA Method 320, 321 & ASTM D-6348!
- Real-time data on-site for evaluation!
- On-site draft test reports & final report in 10 Days!
- Catalyst performance analysis (inlet & outlet testing) on-site with real-time data!
- Speciated VOC's on-site
- Greenhouse Gases measured real-time, on-site ( $N_2O$ ,  $CO_2$ ,  $CH_4$ )!
- SCR tuning with point-by-point data, real-time for  $NH_3$ ,  $NO$ , &  $NO_2$ !
- Portable power by on-board generator!
- 23 QSTI certified personnel!
- Tests in all 50 states, Mexico, & Canada!

**Corporate Headquarters:**  
1600 West Tacoma Street  
Broken Arrow, OK 74012

(918) 307-8865  
(888) 461-8778



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[WWW.AIRHYGIENE.COM](http://WWW.AIRHYGIENE.COM)

**Remote Office Locations:**  
Las Vegas, NV  
Ft. Worth, TX  
Austin, TX  
Shreveport, LA  
Chicago, IL  
Pittsburgh, PA



Air-Hygiene-International-Stack-Testing



@Air Hygiene

# FTIR Compounds

Any gas or liquid compound that absorbs infrared light can potentially be identified and quantified using the FTIR. The gas phase infrared spectral standards are available for the compounds listed below. Reference spectra not included in this list may be already available or can be prepared.

|                                      |   |   |
|--------------------------------------|---|---|
| acetaldehyde                         | ethane                                      | perfluorohexane                         |
| acetic acid                          | ethanol                                     | perfluoromethane                        |
| acetone                              | ethyl acrylate                              | perfluoropropane                        |
| acetonitrile                         | ethyl benzene                               | perfluoropropene                        |
| acetophenone                         | ethyl chloride (chloroethane)               | phenol                                  |
| acrolein                             | ethylbenzene                                | phosphine                               |
| acrylic acid                         | ethylene                                    | propane                                 |
| acrylonitrile                        | ethylene dibromide - (dibromoethane)        | 1,2,3-propanetriol w/methyl oxirane     |
| allyl chloride                       | ethylene dichloride                         | propionaldehyde                         |
| 2-amino-2-methyl-1-propanol          | ethylene oxide                              | propylene dichloride                    |
| ammonia                              | ethylidene dichloride                       | propylene glycol                        |
| aniline (phenylamine)                | fluoroethane                                | propylene glycol methyl ether acetate   |
| arsine                               | fluoromethane                               | propylene oxide                         |
| benzene                              | formaldehyde                                | 1,2-propylenimine-(2-methyl aziridine)  |
| benzotrichloride                     | hexachlorobutadiene                         | quinoline                               |
| benzyl chloride                      | hexachlorocyclopentadiene                   | silane                                  |
| beta-propiolactone                   | hexachloroethane                            | silicon tetrafluoride                   |
| bis (chloromethyl) ether             | hexamethylphosphoramide                     | styrene                                 |
| boron trichloride                    | hexane                                      | styrene oxide                           |
| boron trifluoride                    | hexyl acetate                               | sulfur dioxide                          |
| bromoform                            | hydrazine                                   | sulfur hexafluoride                     |
| 1,3-butadiene                        | hydrogen bromide                            | sulfuryl fluoride                       |
| 1-butanol                            | hydrogen chloride                           | 1,1,2,2-tetrachloroethane               |
| butyl acetate                        | hydrogen fluoride                           | tetrachloroethylene (perchloroethylene) |
| carbon dioxide                       | isophorone                                  | tetraethoxy silane (TEOS)               |
| carbon disulfide                     | isopropanol                                 | 1,1,1,2-tetrafluoroethane               |
| carbon monoxide                      | maleic anhydride                            | 1,1,2,2-tetrafluoroethane               |
| carbon tetrachloride                 | methane                                     | thionyl fluoride                        |
| carbonyl fluoride                    | methanol                                    | toluene                                 |
| carbonyl sulfide                     | methyl bromide - (bromomethane)             | 2,4-toluene diisocyanate                |
| chloroacetic acid                    | methyl chloride - (chloromethane)           | 1,2,4-trichlorobenzene                  |
| 2-chloroacetophenone                 | methyl chloroform - (1,1,1-trichloroethane) | 1,1,2-trichloroethane                   |
| chlorobenzene                        | methyl ethyl ketone - (2-butanone)          | trichloroethylene                       |
| chloroform                           | methyl hydrazine                            | 2,4,5-trichlorophenol                   |
| chloromethyl methyl ether            | methyl iodide - (iodomethane)               | triethylamine                           |
| chloroprene (2-chloro-1,3-butadiene) | methyl isoamyl ketone                       | 1,1,1-trifluoroethane                   |
| m-cresol                             | methyl isobutyl ketone - (hexone)           | 1,1,2-trifluoroethane                   |
| o-cresol                             | methyl methacrylate                         | trifluoromethane                        |
| p-cresol                             | methyl tert butyl ether                     | tungsten hexafluoride                   |
| cumene                               | methylene chloride-(dichloromethane)        | 2,2,4-trimethylpentane                  |
| cyclohexanone                        | n,n-diethyl aniline                         | vinyl acetate                           |
| 1,2-dibromo-3-chloropropane          | nitric oxide                                | vinyl bromide                           |
| 1,4-dichlorobenzene                  | nitrogen dioxide                            | vinyl chloride                          |
| dichloroethyl ether                  | n-nitrosodimethylamine                      | vinylidene chloride                     |
| 1,3-dichloropropene                  | n-nitrosomorpholine                         | m-xylene                                |
| dichlorvos                           | naphthalene                                 | o-xylene                                |
| difluoroethane                       | nicotine                                    | p-xylene                                |
| difluoromethane                      | nitrobenzene                                |   |
| dimethyl carbamyl chloride           | 2-nitropropane                              |   |
| dimethyl formamide                   | o-toluidine                                 |   |
| 1,1-dimethyl hydrazine               | oxygen difluoride                           |   |
| dimethyl phthalate                   | ozone                                       |   |
| 1,4-dioxane - (1,4-diethylene oxide) | pentafluoroethane                           |   |
| epichlorohydrin                      | perfluorobutane                             |   |
| 1,2-epoxybutane                      | perfluoroethane                             |   |

## ► HOW IT WORKS

**Fourier Transform Infrared (FTIR) Spectroscopy** is used to examine and characterize organic and inorganic materials. The technique combines a microscope and infrared spectrometer. Data is produced in the form of a spectrum, with many bands that represent chemical bonding between two particular atoms or a group of atoms in a molecule. The spectrum is subsequently compared to a set of known reference materials for identification and interpretation. As an analytic technique, FTIR has several advantages. It requires only a minute sample. It takes only minutes to conduct and it will work with most liquids or gases.

**Air Hygiene's** sample system incorporates a heated sample pump and conditioning system to ensure data accuracy.



## ► COMPOUND IDENTIFICATION AND DETECTION

The FTIR measures the absorption of various infrared light wavelengths by the material of interest. These infrared absorption bands identify specific molecular components and structures. The MIDAC FTIR system, used by [Air Hygiene](#), is rugged, compact, and precise. The minimum detection limits (MDL) vary with the compound and the effluent matrix being measured. Typically, MDL's range from 40 ppb to 10 ppm depending on the compound of interest.

The EPA has classified formaldehyde as a probable human carcinogen and as a result the EPA has proposed to reduce the concentration of formaldehyde in the exhaust from new or reconstructed stationary combustion turbines to 43 parts per billion by volume or less, dry basis (ppbvd), at 15 percent oxygen (if you use means other than an oxidation catalyst emission control device). **Air Hygiene** uses a cold filter in the FTIR for high sensitivity measurements of formaldehyde. The MDL for formaldehyde is 40 ppb.

## ► DATA ANALYSIS

The FTIR spectrometer system consists of an interferometer, a computer, a data station, and a printer for data output. With an infrared data station, the computer acquires, processes, stores and retrieves spectral data. AutoQuant Pro, a powerful new automated, multi-component, quantitative analysis program, is used for analyzing gas phase mixtures in real time. Quantitative results, concentration vs. time plots, and spectra can be displayed and updated in real-time for continuous monitoring applications.

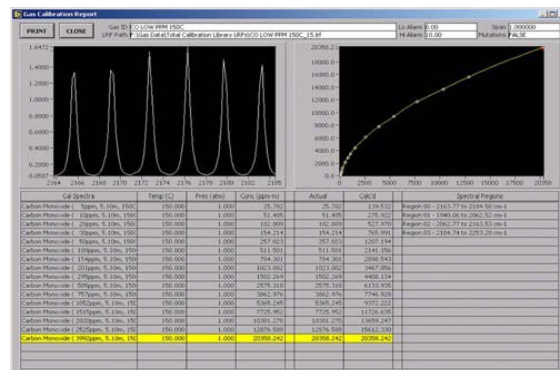
The spectra or the interferogram is a permanent record and can be analyzed at a future time to identify and quantify additional compounds not known during the initial testing program. For example, if the sample was tested for only acrolein and formaldehyde, following the test, the tester is able to identify and quantify toluene, benzene, and acetaldehyde without repeating the test. This ability to perform post-test analysis for additional compounds will save you both time and money.

## ► QUALITY ASSURANCE

**Air Hygiene's** goal is to achieve total customer satisfaction by delivering accurate, on-time analyses that meet each client's needs. It is our responsibility to provide each client with quality results. This is accomplished by documenting all facets of the analysis, communicating any questionable or out-of-specification results to the client, following procedures and complying with standards, and auditing data internally.

## Instrument Independent Calibration

The MultiGas software features multi-point calibration curves that provide a dynamic range up to 9 orders of magnitude (ppb to 100%). Calibrations for many species are provided with the instrument, and additional calibrations can be generated by the user from gases of known concentration. Utilities in the MultiGas software verify the performance of each instrument, which allows a calibration generated on one MultiGas to be used on any other MultiGas without alteration.





# Testing Solutions for a Better World

**Air Hygiene's** core philosophy of "Second-to-None (2-2-0)", demands extra mile customer service anchored on dignified character and family-oriented principles to deliver unmatched quality stack testing, worth paying for every time. We utilize revolutionary technology and **Air Hygiene University** to create the best educated work force to define the future of stack testing.

Providing air emission testing since 1997 and headquartered in Broken Arrow, Oklahoma, **Air Hygiene** provides testing services throughout the continental United States as well as internationally. Its client base includes various industries from oil and gas companies to utilities, manufacturers, and other similar industries.

**Air Hygiene** has experienced testing teams led by project managers with significant testing experience and a broad understanding of the federal and state regulations. **Air Hygiene** has thirty (30) combustion emission testing systems.

Our pricing and flexibility are second to none. **Air Hygiene** prides itself on testing efficiency and has experience with complex testing; including formaldehyde by FTIR (EPA Method 320 or ASTM D-6348) to meet RICE MACT, non-methane/ethane VOCs on-site with field GC or FTIR for JJJJ (40 CFR Part 60 Subpart JJJJ), PM, PM-10, & PM-2.5 testing (EPA Methods 1-5, 201a, 202).

**Air Hygiene** can complete numerous engines in a single day and has experience with testing large engine fleets within short duration or on a repeated schedule to meet periodic monitoring requirements. **Air Hygiene** has five (5) FTIR labs!

Below are some of AHL's satisfied customers. Please contact us for more information!



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