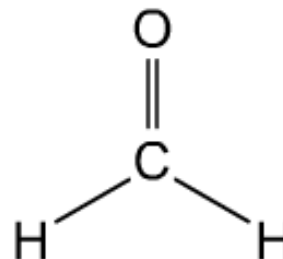


Formaldehyde – Sources, Health effects and Safety.

Formaldehyde is a colourless gas with a characteristic pungent odour. It's widely used in many industries and causes severe health issues if used inappropriately.

Sources of Formaldehyde

Formaldehyde is a toxic chemical widely used to manufacture building materials and various household products. It is also a by-product of combustion and certain other natural processes. Therefore, it may be present in substantial concentrations both indoors and outdoors.



Formaldehyde Chemical Formula

Formaldehyde is used in hundreds of industrial processes including the manufacture of paints, plastic products, paper, textiles, carpets, pesticides and fumigants, particle boards, MDF, chipboard and plywood, cosmetics, thermal insulation foams, furniture, biomedical products, leather goods, adhesives, glues and resins. Anyone involved in the manufacture or use of any of these products may be exposed to formaldehyde. Formaldehyde is also commonly used as a preservative in the embalming industry.

Sources of formaldehyde in the home include building materials, smoking, household products, and the use of un-vented, fuel-burning appliances, like gas stoves or kerosene space heaters. Formaldehyde, by itself or in combination with other chemicals, serves a number of purposes in manufactured products. For example, it is used to add permanent-press qualities to clothing and draperies, as a component of glues and adhesives, and as a preservative in some paints and coating products.

Health Effects

Formaldehyde is highly toxic to humans, regardless of method of intake. Even very short-term exposure to formaldehyde irritates the eyes causing pain, redness, blurred vision and severe eye watering. It can irritate the nose and throat causing sneezing, soreness, coughing, shortness of breath, headaches and nausea.

Exposure to elevated levels can lead to accumulation of fluid in the lung (pulmonary oedema). A large exposure to formaldehyde is converted to formic acid in the body, leading to a rise in blood acidity, rapid-shallow breathing, hypothermia, and coma or death.

Long-term exposure causes chronically impaired lung function, skin hardening, swelling and flaking, dermatitis, allergic eczema, and cancer.

Formaldehyde is a skin and respiratory sensitiser. It is a sensitising agent, which can stimulate the body's immune response so that a subsequent exposure to even a very small amount is likely to trigger an allergic response.

Formaldehyde has also been shown to cause sleep disturbance, impaired memory, reduced concentration, nausea and menstrual irregularity.

It is estimated that 10 to 20 percent of the U.S. population, including asthmatics, may have hyper reactive airways, which may make them more susceptible to formaldehyde effects.

A known cause of cancer

The International Agency for Research on Cancer, (IARC) which is part of the World Health Organisation, has designated formaldehyde as a known cause of several types of throat and nasal cancer.

On 10 June 2011, the US National Toxicology Program has described formaldehyde as "known to be a human carcinogen". The report prepared for the Secretary of the Department of Health and Human Services (HHS), contained warnings from scientists that people with higher exposure to formaldehyde were more at risk for nasopharyngeal cancer, myeloid leukemia and other forms of cancers.

Exposure levels

In the UK formaldehyde has been assigned a Maximum Exposure Limit (MEL) of 2 parts per million (ppm). The MEL for formaldehyde is hard to explain in the light of HSE's own toxicology review which found that eye irritation can be caused by exposure to levels as low as 0.01ppm, 200 times less than the MEL. The UK control limits fail to take account of the fact that skin irritation can occur at levels well below the MEL and that many people will experience "double exposure" by coming into contact with formaldehyde both at work and at home.

In the USA, OSHA has set a permissible exposure level of 0.75ppm. In Sweden and Germany the maximum permissible indoor level is 0.1ppm. Many other nations have similar exposure level regulation in place.

Safety and Detection

In order to ensure employees and the public are not exposed to dangerous levels of Formaldehyde in the air, it is advised to detect and monitor levels with a suitable detection instrument, especially in industries and buildings where formaldehyde is commonly used.

PPM Technology has significant experience in the design and development of instruments for accurate detection and measurement of Formaldehyde.

Our **Formaldemeter** range of instruments has been in existence for over 10 years. We continuously develop and improve the instruments to achieve better performance and features. Our latest instruments are the Formaldemeter htV-m and htV.

"Overexposure to airborne formaldehyde is dangerous to health, but the risks can be substantially reduced if levels are regularly measured and monitored," said MD John B Jones.

"Our latest Formaldemeter htV-m model enables continuous monitoring, so staff will be aware when formaldehyde concentrations reach dangerous levels."



The **Formaldemeter htV-m** is able to accurately detect and monitor formaldehyde, temperature and humidity in real-time. It can be used as a manual hand-held

instrument or as a continuous monitoring device capable of up to one month of data-logging. Samples are taken atomically based on a schedule specified by the user, alternatively samples can be taken in 'manual mode' when user presses 'S' button.

The **htV-M** can precisely measure formaldehyde concentrations in parts per million (ppm) and mg/m³ over a wide range of temperature and humidity. The built in memory and real time clock enables the htV-m to log all 3 parameters and corresponding times, allowing improved monitoring and analysis opportunities. Alternatively a PC can automate the sampling and log data at specific times by a direct or wireless connection.

The **Formaldemeter htV** is a manual hand-held instrument, which can take instantaneous single-point measurements of Formaldehyde, Temperature and Humidity. Both instruments can accurately measure very low or extremely high concentration of formaldehyde.

PPM Technology's standard hand held formaldehyde detectors are able to measure in the range of 0-10ppm, it is now possible for the user to change the settings and monitor for much higher concentrations of Formaldehyde up to approximately 90ppm.

Please visit www.ppm-technology.com/products for more information.

PPM Technology Ltd

Unit 34-35 * Cibyn Industrial Estate
Caernarfon * LL55 2BD * Wales / UK

Tel: +44 (0)1286 676 999

Fax: +44 (0)1286 671 811

info@ppm-technology.com

www.ppm-technology.com

