

Dioxin monitoring in incinerator plant

Dioxin is the name of a group of persistent and very toxic chemicals and is the nastiest, most toxic man-made organic chemical; (dioxin's toxicity is second only to radioactive waste). Dioxin modifies the functioning and genetic mechanism of the cell by "attaching" to a protein in the cell. Dioxin accumulates in the fat cells and human can't metabolize it.

Dioxin Exposure

- When chemicals and plastics are manufactured or burned, dioxin is produced as an unwanted (but INEVITABLE) by-product.
- Thousands of tons of chemicals and plastic wastes are breaking down in the form of dioxin.
- According to EPA, much of the population of the world is at the dose of dioxin at which there can be serious health effects.
- Green peace as the largest single source of dioxin entering the environment has identified Polyvinyl Chloride, from production to disposal in incinerators.

Sources

- Incineration of municipal and Medical waste
- Burning wood in homes and industry
- Forest fires
- Bleaching wood pulp and paper products
- Chemical manufacturing
- Metal smelting



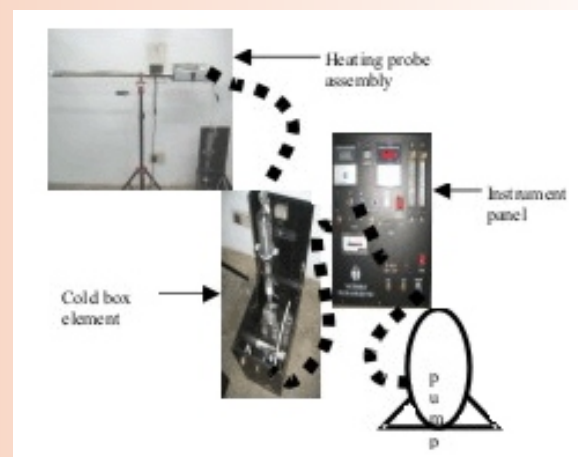
Effects of dioxin

- Dioxin interacts with AhR (Aryl hydrocarbon receptors), which results in the formation of proteins in the nucleus that interfere with cellular growth and differentiation.
- Since dioxin dissolves in fat, it must be transformed in the liver to become water-soluble so it can be excreted. This is a slow process, so dioxin accumulates in our fat and liver
- Neurobehavioral effects
- Increase in diabetes
- Cardiovascular diseases in men
- Higher rate of heart disease in men
- Liver diseases
- Chloracne and hyper pigmentation

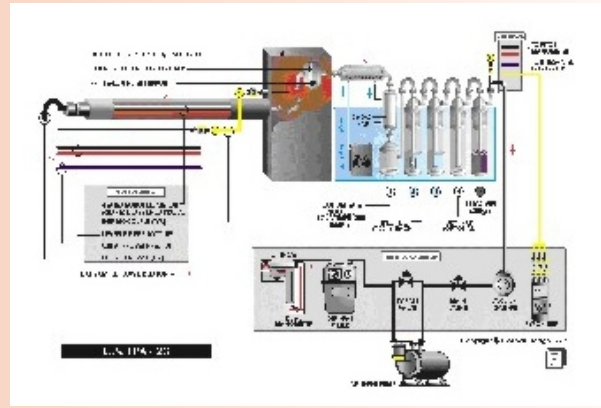
Why to monitor dioxin

Monitoring air quality is essential for local authorities as well as for major public and private industries to understand and prevent air pollution and assess emission sources, in order to preserve health and contribute to the fight against the greenhouse effect. Since incinerators are the place where dioxin level increases at construction, destruction as well as during operation of the plants. And after citing the above health hazards of the dioxin one can estimate how important it is to monitor dioxin level for living as well as non-living environment.

Model of dioxin monitoring set up: -



*The model is based on EPA,
which is as follows: -*



Analysis: -

The sensitive and accurate method has been developed for the determination of Dioxin with gas chromatography and mass spectrometric detection (GC-MS) as well as High Resolution Mass Spectrometer according to EPA method 23: -

Gas Chromatograph Operating Conditions

- Injector. - Configured for capillary column, split less, 250 °C.
- Carrier Gas. - Helium, 1-2 ml/min.
- Oven. - Initially at 150 °C. Raise by at least 40 °C/min to 190 °C and then by °C/min up to 300 °C.

High Resolution Mass Spectrometer.

- Resolution. - 10,000 m/e.
- Ionization Mode. - Electron impact.
- Source Temperature - 250°C.
- Monitoring Mode. - Selected ion monitoring.



Our Accreditation: -

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- ISO per 9001: 2000
- Ministry of Environment & Forest
- State Pollution Control Boards (Orissa, Haryana, HP)
- NPC (Environment Division), etc

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