APPLICATION NOTE

Gasmet™ DX4030 in industrial air quality monitoring

Health Hazard Evaluation in the Flavor and Fragrance Industry

Manufacturing of powdered and liquid flavorings and fragrances involves production steps where flavoring chemicals may be released into the air breathed by workers. Exposure control by gas analysers in the production rooms and laboratories is necessary to ensure that the Time Weighted Average (TWA) concentrations do not exceed the maximum Permissible Emission Limit (PEL) values.

The United States National Institute for Occupational Safety and Health (NIOSH) has suggested that diacetyl, when used in artificial butter flavoring (as used in many consumer foods), may be hazardous when heated and inhaled over a long period, leading to increase in the occurrence of fixed obstructive lung disease. Gasmet FTIR multi-gas analysers have been used to detect and quantify Diacetyl together with Acetoin, another butter-flavor additive in foodstuffs, as well as organic acids, aldehydes, and ketones.

A Gasmet DX4030 FTIR multi-gas analyser is a powerful tool for investigating the real-time and TWA concentrations of Acetoin and other volatile organic compounds in the ambient air. Real-time analysis of up to 25 gases simultaneously can measure the critical components with lowest PEL's in the presence of other, less harmful volatile organic compounds. The large dynamic range of FTIR measurement also allows measurement of chemical concentrations inside the ventilated bench hoods and work stations in order to determine the ventilation efficiency.

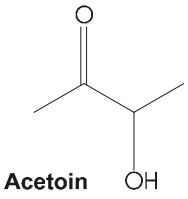
The battery powered portable FTIR analyser combined with a handheld computer offers a unique combination of analytical power and flexibility. The on-board library of 25 gases may be modified easily by using a laptop computer and optional Calcmet software. Besides being able to quantify the prescribed gases with high accuracy (2% of range), the recorded FTIR spectrum can be used to detect the presence of additional chemicals and identify them. The instrument has a short start-up time and can be used while moving, minimizing the time required to carry out measurements even in a large production facility.

Typical application for acetoin and diacetyl monitoring

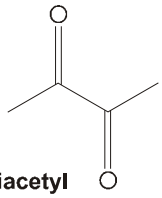
Gas	Range	Detection limit*	15 min limit**	8 hour limit**
Acetoin	0 – 500 ppm	0.07	1500	500
Diacetyl	0 – 100 ppm	0.13	35	25
Acetaldehyde	0 – 300 ppm	0.01	300	100
Benzaldehyde	0 – 500 ppm	0.20	-	1000

* Limit of detection is calculated as 3 × standard deviation of baseline noise

** European and/or British short and long term workplace exposure limits (WEL's).



Acetoin


Diacetyl

Gasmet Technologies inc., 1410 Taschereau B-202, La Prairie, Qc, Canada, J5R 4E8
Toll free : 1-866-685-0050 www.gasmet.com sales@gasmet.com