

PFIB



Introduction

PFIB (Perfluorobutylene) is a gaseous compound from the group of Fluorinated Hydrocarbons. It is very toxic at ppb- concentrations already, inodorous, colorless, flavorless, heavier than air and very stable. The effects of intoxication can occur hours or even days after exposition. Thus, it is very dangerous. In specific processes in the chemical industry this compound is produced as un- wanted byproduct, such as the production of PTFE (Teflon), which cannot be avoided. Since there's no actual purpose for PFIB, it is separated and devastated immediately. Furthermore it can be formed during the thermal decomposition of fluorinated Polymers.

Challenge

A potential exposition to human bodies can occur by inhalation. Due to the properties of PFIB, this will not be recognized immediately. Humans potentially exposed to chemicals like this, normally are workers in chemical plants, where PTFE and similar products (polymers) are fabricated. Furthermore for living areas close to such production sites this poses a significant threat. So it is mandatory to monitor not only work places but also the whole production plant environment for the presence of traces of PFIB. Adequate monitoring equipment is therefore a LTO- requirement.

Solution

IUT Technologies' IMS-Analyzer is capable of detecting and quantifying substances like these in the required (sub-) ppb concentration level. The coupling of a gas chromatographic pre- separation prior to the high sensitive IMS technology provides an analyzing performance, where compounds like PFIB can be measured and quantified with outstanding sensitivity, repeatability within cycle times of less than a minute. By applying GC- pre separation, the unique method properties of IMS are available even in the background matrix of chemical production plants.

IMS- Analyzers are based on a field-proven Ion Mobility Spectrometry (IMS) technique that is highly selective and sensitive to fluorinated hydrocarbons. IMS is an atmospheric pressure, time of flight detection technique. The sensitivity, selectivity, and speed of response make the technique superior in many aspects compared to other monitoring methods. The industry- proof spectrometer design allows using these advantages in 24/7 stand- alone operation. Unlike electrochemical devices, the IMS units are impervious to extreme temperature or humidity conditions. IUT Technologies' IMS units are designed for long term, continuous measurements with little or no maintenance and few consumables. The electronics are completely solid-state without moving parts or optics to require alignment.