

BENZENE DETECTION

PROTECTING LIVES AND PRESERVING THE ENVIRONMENT

Benzene

VOCs frequently exist as a mixture of hydrocarbon vapours, and this presents a measurement challenge if one of the components, such as benzene, is particularly hazardous. The new Tiger XT Select has therefore been developed to selectively measure benzene.

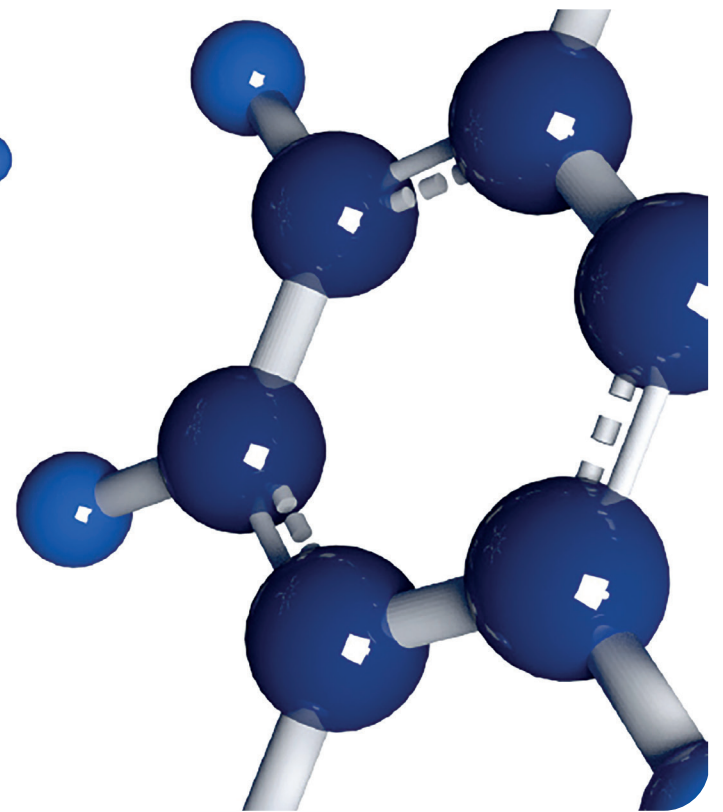
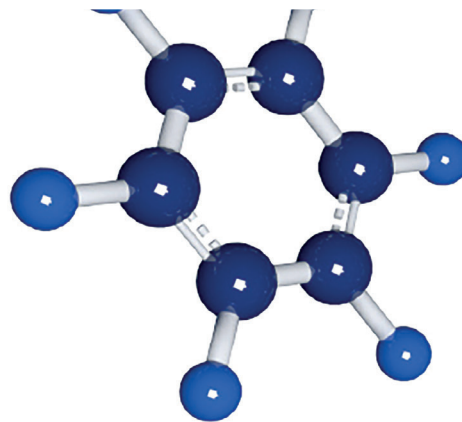
Benzene is used in the manufacture of plastics, detergents, pesticides, synthetic fibres, rubber, lubricants, dyes and many different chemicals. It also exists in all process streams in the production or processing of oil and gas, as well as in produced water. Exposure to benzene typically occurs through leaks and spills, and when confined systems are opened for sampling, product transfer, inspection or maintenance, or loading and unloading during transport. Engine exhaust and cigarette smoke contain benzene and contaminated materials such as soil, paint and solvents can also present a threat. People at risk of benzene exposure include those working in oil refineries; chemical and petrochemical plants, including some offshore installations; coke works; foundries, during casting (where benzene sulphonic catalysts are used); and where petrol/gasoline or benzene is stored or distributed.

Benzene exposure occurs by breathing air containing benzene vapour; by absorption through skin; or by swallowing. The health effects depend on the concentration of benzene and the length of exposure time. The immediate effects of exposure to a high concentration (hundreds of ppm or more) can include tiredness, dizziness, headache and nausea. However, benzene can also cause unconsciousness at high levels (thousands of ppm). Importantly, benzene is a carcinogen and long-term exposure to lower concentrations of benzene can result in bone marrow suppression and serious blood disorders, as well as leukaemia. International regulations have established benzene limits, imposing requirements on employers to assure that no employee is exposed to an airborne concentration of benzene in excess of the TWA (time-weighted average) limit. In the USA and in most European countries, the 8-hour TWA limit is 1 ppm, although lower levels have recently been proposed in Germany. Similarly, the American Conference of Governmental Industrial Hygienists (ACGIH) has proposed a lowering of the benzene 15-minute STEL (short-term exposure limit) and TWA limits. Currently, the OSHA permissible exposure limit (PEL) is 1 ppm (8-hr TWA), and 5 ppm during any 15-minute work period. The NIOSH recommended airborne exposure limit (REL) is 0.1 ppm (10-hr TWA) and 1 ppm during any 15-minute work period.

Tiger XT Select Benzene PID Detector

ION Science has launched a new range of portable VOC detectors, known as Tiger XT, offering users enhanced levels of performance and durability. ION Science Ltd Managing Director Duncan Johns explained: "Our instruments are frequently used in the most challenging conditions; forming part of the essential toolkit for environmental, health and safety staff. As a consequence, we are constantly looking to enhance the durability of our VOC detectors, and the new Tiger XT handheld range, is our toughest yet."

The new Tiger XT Select (XTS) utilises the ION Science 10.0 eV lamp to detect Total Aromatic Compounds (TACs) such as benzene, toluene and xylene down to concentrations as low as 1 ppb. The instrument is supplied with a pack of benzene pre-filter tubes, which enable the selective detection of benzene. This speciation capability for benzene is a major advantage, given the toxicity and associated regulations that apply to benzene, along with the complexity and cost of alternative benzene-specific measurement techniques.



Cub TAC 10.0 eV Personal Gas Monitor

When worker exposure exceeds pre-set limits, this personal benzene gas monitor has audible, vibrating, and flashing LED alarms that alert you to the gases present. Readings are displayed on its bright, backlit LCD display with selectable data logging time.



Cub TAC 10.0 eV personal gas monitor has a dynamic benzene detection range of 0 to 5000 parts per million (ppm), with its market-leading ppb sensitivity. This personal gas monitor comes with all the benefits of the Cub 10.6 eV personal VOC detector but has a 10.0 eV lamp utilising a unique light filtering technology to give a reliable aromatic hydrocarbon concentration.

Titan Fixed Benzene Specific Gas Monitor

The fixed benzene specific gas monitor is wall-mounted with a dynamic monitor range of 0 – 20 ppm with 0.1 ppm sensitivity to benzene. Our fixed benzene gas monitor samples gas from the environment once per minute and within just 60 seconds an accurate benzene measurement is displayed.

The Titan fixed benzene specific gas monitor provides an immediate warning alarm system with two operator configurable levels, ensuring your workers are kept safe and protected to the standards required on site.

The Titan fixed benzene specific gas monitor has continuous, real-time measurement allowing trends to be monitored over time, and communicated via 4-20 mA or RS485. Data is stored internally and can be downloaded remotely for analysis.

Pre-Launch Exclusive...

ION Science Ltd are excited to announce the development of Titan 2 which will launch in 2023!

This instrument has been developed to meet increasingly stringent international legislation. Current EU regulation defines a maximum eight-hour time-weighted average for benzene of 1 ppm, which equates to a concentration of 3.25 mg/m³.

The Titan 2 has integrated the new 10.0 eV HS sensor which reduces the likelihood of cross sensitivity and can detect benzene rapidly at levels as low as 20 parts per billion (0.02 parts per million). This extensive detection range complies with the benzene regulation changes that will come into play in 2024.



For more information, please contact info@ionscience.com.



Author Contact Details

Rhys Redrup, Instrumentation Marketing Specialist • Ion Science Ltd

- The Hive, Butts Lane, Fowlmere, Royston, SG8 7SL, UK • Tel: +44 (0) 1763 208503
- Email: info@ionscience.com • Web: www.ionscience.com



Read, Print, Share or Comment on this Article at: petro-online.com/Article

