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HYDROGEN SULFIDE IN BUNKER FUEL

Lately we have been receiving reports from our customers about presence of hydrogen sulfide in bunker fuel, bunkered in Singapore and other ports. The main thing to remember is that this gas is very smelly, but smelling it does not mean that it is present at toxic levels. In fact, it can be smelled at 0.02ppm and it can irritate the eye at 0.1ppm. Only at 5 to 10ppm levels and that too during prolonged exposure, it can get toxic.

We have tested for the presence of Hydrogen Sulfide both in liquid and in the headspace of the sample bottle. In the samples that we have tested, the quantity rarely exceeded 10ppm.

We are, however, providing all relevant information for your ready reference. We will be happy to provide additional information if needed.

Toxicity levels of Hydrogen Sulfide

Hydrogen Sulfide is an extremely hazardous, toxic gas. This is a colorless, flammable gas with rotten egg odour. The main source of Hydrogen Sulfide is during refinery of petroleum and during extraction of natural gas.

Hydrogen Sulfide has a very low odour threshold and even at parts per billion levels, one can smell Hydrogen Sulfide. Higher concentrations can lead to sickening sweet odour leading to loss of sense of the smell and above 500 parts per million level, it is fatal.

Level	Effect
0.02ppm	Odour threshold
0.10ppm	Eye irritation
5 – 10ppm	Suggested maximum allowable concentration for prolonged exposure
70 – 150ppm	Slight symptoms after exposure for several hours
170 – 300ppm	Maximum concentration that can be inhaled for 1 hour with out serious consequences
400 – 600ppm	Dangerous after exposure for ½ to 1 hour
700ppm	Fatal with ½ hour exposure

(Courtesy: OSHA Allowable levels)

Effect of presence in Bunker Fuels

Occasionally fuel from refineries may contain Hydrogen Sulfide. With a vapor density of 1.19, Hydrogen Sulfide is approximately 20% heavier than air. So this invisible gas can collect in confined spaces of tanks and reaction vessels.

Once the smell is detected, all precautions should be taken until the concentration levels are determined. A protective equipment such as supplied –air respirator should be used in the engine and purifier room. Direct reading gas detection instruments should be used before entering confined spaces and protective equipments should be used if the level is more than 10ppm.

At Viswa Lab, we had analyzed bunker fuels for the presence of Hydrogen Sulfide. We quantify hydrogen sulfide in the headspace in the sample bottle and also in the liquid fuel. If the levels are more than 10ppm, which is the suggested allowable maximum concentration for prolonged exposure, we alert our customers. If the levels are dangerously high we advise our customers to debunker the problem fuel at the nearest port.

Instruments for Measuring Hydrogen Sulfide

1. A three-component unit for continuous measuring: Hydrogen Sulfide Analyzer, Model 850 by Houston Atlas Inc.
2. Portable unit: Interscan portable, direct reading analyzer for Hydrogen Sulfide by Interscan Corporation, California.
3. Portable Unit: Dragon Multigas Detector with tubes by National Mine Service. Pittsburg.
4. Detector cards for multiuses: Colortec Hydrogen Sulfide detector Cards by Metronics, California.

Best regards,

Dr. Vis
Viswa Lab Corporation