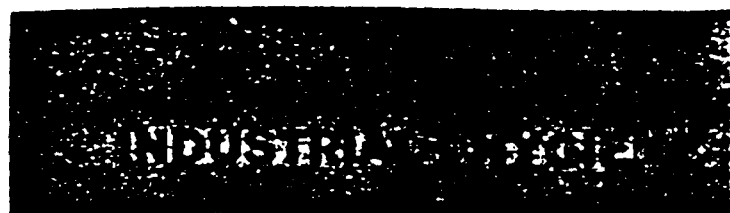


FILE NAME: Oil Industry and American Petroleum Institute (API)

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BULLETIN



50 WEST 50TH STREET • NEW YORK 20, N.Y.

SAFETY DATA SHEET

BENZENE

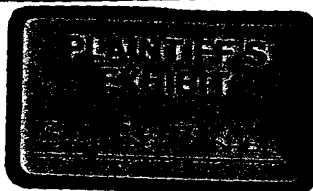
Flammable Liquid

Vapor - Narcotic and Cumulatively Toxic

Warning Properties - Poor

PROPERTIES

Formula	C_6H_6	Lower Explosive Limit	1.5% Vol.
Boiling Point	80.1°C	Upper Explosive Limit	8.0% Vol.
Flash Point (Tag. Closed Cup)	-11.1°F (Approx.)	Autoignition Temp.	538°C
Vapor Pressure at 25°C	100 mm (Approx.)	Vapor Density (Air = 1)	2.77
<u>Threshold Limit Value (MAC)</u>		35 ppm	
<u>Predicted Effects</u> of continuous inhalation of vapor at twice the threshold limit.		Faint odor, systemically harmful to sensitive workers following daily inhalation for protracted period of time.	
<u>Maximum Vapor Concentration Attainable</u> in air at 25°C - 760 mm Hg.		131,000 ppm	
<u>Liquid Volume</u> which, if volatilized and distributed equally in 1000 ft. ³ of static air, would give a concentration equal to the MAC (35 ppm)		3.5 ml	
<u>Liquid Volume</u> which, if volatilized and distributed equally in 1000 ft. ³ of static air, would give a concentration which would be <u>lethal</u> in a short period of time		1,500 ml; 3 pints	



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SENSORY RESPONSE VALUES

ATMOSPHERIC CONCENTRATION PPM	TIME OF EXPOSURE	PROBABLE RESPONSE (HUMAN)
35		No response. The odor is not detected by most people and there is no irritation.
50-100	5 min.	Faint odor detectable by the unacclimated.
700	30-60	Strong odor; may produce narcosis.
20,000	5-10	Strong irritating odor; may be lethal.

HEALTH HAZARDS

VAPOR EXPOSURE

Benzene is narcotic in high vapor concentrations and cumulatively toxic in lower concentrations. In high vapor concentrations, such as may be found in tanks or partially closed vessels, benzene may produce drowsiness, fatigue, headache, nausea and narcosis, and, with sustained exposure, conceivably death caused by paralysis of the respiratory centers. Some cases of severe overexposure may show exhilaration and actions characteristic of the inebriated. Concentrations of vapor which produce the above symptoms are usually recognized by their strong and pungent odor and are easily identified by testing with an ordinary combustible gas indicator. This aspect of benzene intoxication does not ordinarily cause a problem in industry and is usually of secondary importance to the hazard of chronic intoxication.

Continuous daily exposures to vapor concentrations in sub-narcotic levels, but in excess of the threshold limit value (35 ppm), may, after a protracted period of time (usually several years), result in damage to the blood-forming organs of the body. Such damage may be produced without any significant premonitory warning of ill health. Hence, benzene is insidious in its action because of the lack of significant warning properties associated with both overexposure to the vapor and early systemic intoxication. In spite of the foregoing, there have been surprisingly few cases of benzene intoxication reported in the last ten years. This is notable considering the widespread use of benzene in industry. The classical reports in the literature of mass intoxications reflect, for the most part, the experience of a past era - one in which complete disregard for control measures predisposed to very severe overexposures.

The establishment of the very low threshold limit value (35 ppm) for benzene reflects an effort on the part of regulatory agencies to protect workers who may be exposed to this cumulatively toxic material continuously, day after day, for a working lifetime. Justification for the establishment of this level is seen when one considers that at this level a reasonably active worker inhales roughly 1.3 ml. of benzene per 8-hour day or approximately 10 ounces per working year.

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