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OZONE

Material Safety Data Sheet

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Section 1 - Product identification

Product Name: Ozone

Synonyms: Triatomic Oxygen, O₃

Chemical Family: Oxidizer

Molecular Formula: O₃

Molecular Weight: 48.0

Section 2 - Hazardous Ingredients

Components: Ozone Gas

Concentration: 0-20% by weight

Gas Registry Number: 10028-15-6

NIOSH REL: 0.1ppm (0.2 mg/m³) CEILING

OSHA PEL: 0.1 ppm (0.2 mg/m³) TWA

Section 3 - Physical Data

Boiling Point: -111.9 C

Melting Point: -192.7 C

Solubility in Water by weight at 20 C: 0.003 g/l (3 ppm)

Vapor Density (air =1)

Appearance and Odor: Ozone is colorless at all concentrations experienced in industry. It has a very pungent characteristic odor usually associated with electrical sparks. Ozone odor is generally detectable at concentrations of 0.02-0.05 ppm.

Section 4 - Fire/Explosion Hazards Data

Ozone is a powerful oxidizing agent and oxidation with ozone evolves more heat and usually starts at a lower temperature than oxidation with oxygen.

Ozone is an unstable gas, which, at normal temperatures, decomposes to oxygen.

FLASH POINT: Not Applicable

AUTOIGNITION: Not Applicable

FLAMMABILITY: Non Flammable but vigorously supports combustion.

EXTINGUISHING MEDIA: Depends on source media.

Section 5 - Reactivity Data

Conditions Contributing to Instability: Ozone spontaneously decomposes under all ordinary conditions, so that it is not encountered except in the immediate vicinity of where it is formed. The decomposition is speeded by solid surfaces and by many chemical substances. Ozone has an average half-life of 20 minutes and in most cases should be completely converted within one hour after treatment has ceased.

Incompatibilities: Ozone is a powerful oxidizing agent and reacts with all oxidizable materials, both organic and inorganic.

Hazardous Decomposition Products: None

Special Precautions: This compound is irritating and injurious at concentrations >1 ppm. It may cause severe irritation of the respiratory tract and eyes.

Section 6 - Health Hazard Data

Permissible Exposure Limit: The current standard for ozone is 0.1 part of ozone per million parts of air (ppm) averaged over an eight-hour work shift. This may also be expressed as 0.2 milligrams of ozone per cubic meter of air (mg/m³). No criterion is set for the permissible concentration of ozone in water.

Symptoms of Exposure: A sharp irritating odor is noticed after exposure to very low concentrations (=0.04 ppm) of ozone for a very brief period of time. As the concentration of ozone increases, the ability to smell it may decrease. Irritation to the eyes, dryness of the nose and throat, and a cough may be experienced. If the ozone concentrations continue to rise, more severe symptoms may develop. These may include headache, upset stomach, or vomiting, pain or tightness of the chest, shortness of breath or tiredness. Finally, with higher levels of exposure, the lungs may be damaged and death may occur.

Toxicological Properties: Ozone is extremely irritating to the upper and lower respiratory tract. The characteristic odor is readily detectable at low concentrations (0.02 ppm to 0.05 ppm). Ozone produces local irritation of the eyes and mucous membranes and may cause pulmonary edema at high exposure. Systematically, ozone has been reported to mimic the effects of ionizing radiation, and may cause damage to chromosomal structures. A partial tolerance appears to develop with repeated exposures. Although most effects are acute, the possibility of chronic lung impairment should be considered, based upon animal experimentation.

Section 7- Preventive Measures

Ozone has an average half-life of 20 minutes and should be completely converted within one hour's time.

1. Ventilate area of treatment to disperse gas.

Personal Protective Equipment: Respirators may be used when engineering and work practice controls are not technically feasible, when such controls are in the process of being installed, or when they fail and need to be supplemented. Respirators may also be used for operations which require entry into treatment areas, and in emergency situations.

Only appropriate respirators shall be provided and used when the use of respirators is the only means of controlling exposure for routine operations, or during an emergency. (Refer to Table 1 of ANSUI/ASTM E591-77 for appropriate respirator selection).