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# MATERIAL SAFETY DATA SHEET FOR OZONE GAS

| Product Information | |
|---|---|
| Product Name | Ozone |
| Synonyms | Triatomic Oxygen, $O_3$ |
| Chemical Formula | $O_3$ |
| Description | Gaseous oxidant |
| Molecular Weight | 48.0 |
| Other Designations | None |
| **Hazardous Components** | |
| Components | Ozone Gas |
| Concentration | 0-15% by weight |
| CAS# | 10028-15-6 |
| ICSC# | 0068 |
| **Physical Data** | |
| Boiling Point (760mm Hg) | -111.9° C |
| Melting Point | -192.7°C |
| Gas Density (0°C and 1 atm.) | 2.14 g/l |
| Vapor Density (air=1) | 1.6 |
| Water Solubility (20°C, 4% ozone in oxygen) | 19 mg/l |
| Specific Gravity | 1.614 |
| Odor | Pungent |
| Appearance and Odor: | Colorless gas with pungent odor generally detectable at 0.01 to 0.04ppm and a sharp disagreeable odor at 1.00ppm. |
| **Fire and Explosion Hazard Data** | |
| Flash Point | Not Applicable |
| Auto-Ignition Temperature | Not Applicable |
| Flammability | Non-Flammable but enhances combustion of other substances. Some reactions may cause fire or explosion. |
| Extinguishing Media | Use extinguishing media appropriate for the fuel source. |
| Special Fire Fighting Procedures | Use self-contained breathing apparatus. Ozone is an oxidizer. |
| Unusual Fire and Explosion Hazards | Ozone can react explosively with readily oxidizable substances and reducing agents. |

| Reactivity Data | |
|---|---|
| Stability | Unstable. Decomposes to form oxygen under ordinary conditions thus is not encountered except in the immediate area where it is formed. |
| Reactivity | Reacts with any materials that can oxidize. Reactions with some materials such as alkenes, ether and other compounds are highly unstable and explosive. |
| Hazardous Decomposition | None. Ozone decomposes rapidly to oxygen ($O_2$). |
| Conditions to Avoid | Do not concentrate to high levels (>17%/wt.). The decomposition of ozone at high concentrations can become explosive. |
| Incompatibility | Avoid contact with materials that can oxidize. |

| Health Hazard Data | | |
|---|---|---|
| Threshold Limit Value | The American Conference of Governmental Industrial Hygienists has set a threshold limit value for occupational exposure to ozone of 0.1 ppm as a time-weighted average over an 8-hour day. The short-term exposure limit is currently 0.3 ppm. | |
| Primary Route of Entry | Pulmonary system | |
| Effects of Single Overexposure | May cause irritation of the respiratory tract experienced as nasal discomfort, dryness, irritation of the throat, pain or congestion of the chest, difficult breathing or coughing. Irritation of the eyes, headache, nausea and drowsiness may also occur. Concentrations above 9 ppm have been found to result in pneumonia. Exposure to high concentrations could be fatal. | |
| Emergency First Aid | | |
| Exposure | Symptom/Prevention | First Aid |
| Emergency Overview | Ensure adequate ventilation in the area where ozone is present | Remove from the presence of air containing ozone. |
| Inhalation | Irritating to respiratory system. Cough, headache, shortness of breath. Ventilation. | Remove from the presence of air containing ozone. Administer oxygen if necessary. If breathing is difficult or discomfort persists, obtain medical attention. |
| Skin | Not an expected route of entry. | |
| Eyes | Irritating to eyes. Ventilation. Face shield or eye protection with breathing protection. | Remove from the presence of air containing ozone. Rinse with water for several minutes and seek medical attention if necessary. |
| Ingestion | Not an expected route of entry | |
| Exposure Control / Personal Protection | | |
| Engineering Controls | Ozone equipment should be operated with an ozone off-gas destruct process. | |
| Ventilation | Ozone off gas should be collected and destroyed prior to release. | |
| Eyes/Face | Not applicable | |
| Skin | Not applicable | |
| Respiratory | Respirator or self-contained breathing apparatus for concentrations greater than 0.1ppm. | |
| Handling | Not applicable | |
| Storage | Ozone gas cannot be stored. Ambient ozone gas monitors should be used for detection. | |
| Disposal Information | | |
| Waste Disposal | Ozone rapidly decomposes to form oxygen ($O_2$). Use an ozone destruct system to convert any unused ozone or off gas into oxygen prior to discharge. | |