

| GAS             | SYMBOL | SPECIFIC GRAVITY | COLOR, ODOR OR TASTE   | FLAMMABLE / EXPLOSIVE                    | SOURCE(S)   | ROUTE OF ENTRY                    | TLV (PPM)* | TOXIC EFFECTS  | FIRST AID   |
|-----------------|--------|------------------|--|--|---|-----------------------------------|------------|--|---|
| Air             | —      | 1.0000           | None   | No                                       | Atmosphere  | Inhalation                        | —          | —  | —   |
| Nitrogen        | N2     | 0.967            | None   | No                                       | About 4/5th of atmosphere. Rock strata from some mines.   | Inhalation                        | —          | Asphyxiant from oxygen deficiency.   | Move victim to fresh air. Perform artificial respiration if needed. |
| Oxygen          | O2     | 1.105            | None   | No                                       | 1/5th of atmosphere.  | Inhalation                        | —          | Oxygen deficiency<br>Below 17%-panting<br>Below 15%-dizziness<br>Below 9%-collapse<br>Below 7%-death   | Move victim to fresh air. Perform artificial respiration if needed. |
| Carbon Dioxide  | CO2    | 1.529            | Low concentration - none. High concentration - slightly acidic taste                           | No                                       | Oxidation of coal. Rotting mine timbers. Breathing, blasting, explosions, fires, diesel engines, and rock strata in some mines. | Inhalation                        | 5,000      | Concentrations of 5% can produce shortness of breath and headaches. Concentrations of 10% can produce death due to oxygen deficiency.            | Move victim to fresh air. Perform artificial respiration if needed. |
| Methane         | CH4    | 0.5545           | None   | Yes<br>5% - 15% with at least 12% Oxygen | Coal and rock strata, carbonaceous shale, and rotting mine timbers.   | Inhalation                        | —          | Oxygen deficiency  | Move victim to fresh air. Perform artificial respiration if needed. |
| Carbon Monoxide | CO     | 0.967            | None   | Yes<br>12.5% - 74%                       | Diesel engines, fires, explosions, and blasting   | Inhalation                        | 50         | Low concentrations can produce headache, dizziness and drowsiness. Higher concentrations can produce nausea, vomiting, collapse, coma and death. | Move victim to fresh air. Perform artificial respiration if needed. |
| Nitric Oxide    | NO     | 1.036            | Colorless in low concentrations. Reddish-brown in high concentrations. Odorless and tasteless. | No                                       | Blasting or burning of dynamite, diesel engines, and electrical discharge.  | Inhalation, skin and eye contact. | 25         | Irritation of eyes, nose and throat. Drowsiness and unconsciousness  | Move victim to fresh air. Perform artificial respiration if needed. |

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| Nitrogen Dioxide | NO2 | 1.589  | Colorless in low concentrations. Reddish-brown in high concentrations. Sharp sweet odor and tasteless. | No  | Blasting or burning of dynamite, diesel engines, and electrical discharge.  | Inhalation, skin and eye contact. | 5  | Gas can irritate eyes and mucous membranes and cause pulmonary irritation. Extremely corrosive when inhaled - cause severe burns to skin, eyes and mucous membranes. | Irrigate eyes immediately. Flush skin with water. Move victim to fresh air. Perform artificial respiration if needed. If swallowed, get medical help, give large amounts of water - do not induce vomiting. |
| Sulfur Dioxide   | SO2 | 2.264  | Colorless, strong sulfur odor and acidic taste.  | No  | Fires involving iron pyrites. Some diesel fuels.  | Inhalation, skin and eye contact. | 5  | Respiratory irritation. Corneal burns.   | Irrigate eyes immediately. Flush skin with water. Move victim to fresh air. Perform artificial respiration if needed.   |
| Hydrogen Sulfide | H2S | 1.1910 | Colorless and an odor of rotten eggs.  | Yes<br>4.5% - 45% with enough Oxygen          | Rotting mine timbers, mine water and rock strata in some mines.   | Inhalation, skin and eye contact. | 10 | Irritation of eyes and respiratory tract. Acute exposure may cause immediate coma and rapid death from respiratory paralysis.  | Irrigate eyes immediately. Flush skin with water. Move victim to fresh air. Perform artificial respiration if needed.   |
| Hydrogen         | H2  | 0.0695 | None   | Yes<br>4.1% - 74% with as little as 5% Oxygen | Fires, explosions, battery charging. Water or steam contacting hot carbonaceous material. Strong acids on metals. | Inhalation                        | —  | Oxygen deficiency  | Move victim to fresh air. Perform artificial respiration if needed.   |

\* PPM - parts of gas per million parts of the gas-air mixture