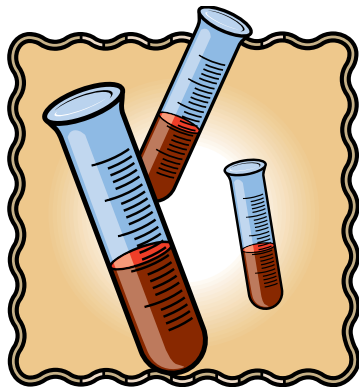


AIR

Carbon Monoxide

General

Carbon monoxide (CO) is a colorless, odorless, tasteless, poisonous gas. CO is a byproduct formed when carbon in fuels is not completely burned. It occurs naturally in the air as the result of processes such as agricultural fires, oxidation of methane, plant growth and decay, and other natural processes. Man-made sources of CO are responsible for high concentrations often found in urban areas. The urban atmosphere contains 100 times as much CO as any other pollutant, making it the most abundant pollutant in the urban air. However, keep in mind that numerous other pollutants may be more hazardous in lower concentrations. The high concentration of urban CO is produced primarily by motor vehicles, which account for over 90% of CO emissions. CO is also released by some industrial processes and in-home uses. Since motor vehicles are the major source of CO, daily concentration peaks coincide with morning and evening rush hours when city traffic is heaviest.



The accumulation of CO is more prevalent from October through March because the weather is calmer, inversion layers occur, and motor vehicles run less efficiently in the cold. Other characteristics of a potentially high CO day include: a weekday when traffic is prevalent, a time between 6 p.m. and 2 a.m. when the wind is low,

temperature is in the 40's (°F), and little or no cloud cover is present. Under these conditions, CO can accumulate to harmful levels, resulting in adverse health effects.

Effects

CO affects the central nervous system by depriving the body of oxygen. Once inhaled, CO enters the blood stream and binds chemically to hemoglobin, the component of blood that carries oxygen through the body. Hemoglobin binds more readily with CO than with oxygen; thus, in the presence of CO, hemoglobin cannot properly distribute oxygen to the body. This reduces the amount of oxygen delivered to all tissues of the body. CO weakens the contractions of the heart, which in turn decreases the volume of blood being pumped to the muscles and organs. The health threat is most serious for people suffering from cardiovascular

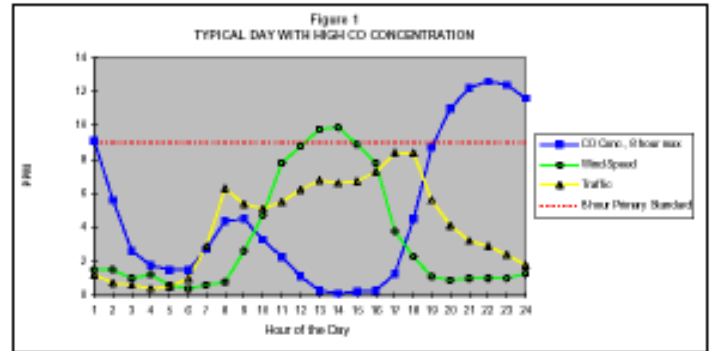


Figure 1 illustrates the typical events occurring on a day when high CO concentrations are experienced. CO concentration rises with the morning peak in traffic and then declines as the wind speed increases and traffic decreases. In the late afternoon the wind subsides as the second traffic peak occurs, resulting in an evening high CO concentration.

disease who are unable to compensate for the decrease in oxygen. Also, individuals with anemia or lung diseases, fetuses, pregnant women and even healthy children are likely to be more susceptible to the health effects of CO. Healthy adults are affected, but only at higher levels of exposure. Visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, and difficulty performing complex tasks are often associated with exposure to high CO levels. Even at low concentrations, CO can affect mental function, vision, and alertness.

Standards

EPA has developed two national primary standards for CO: 35 ppm averaged over a 1- hour period and 9 ppm averaged over an 8-hour period. For the EPA to consider an area in compliance with the standard, these values may be exceeded only once in a given year. Once a monitor measures a second exceedance of either standard in a calendar year, a violation of that standard has occurred. EPA methodologies state that comparisons of data with standards should be made in

integers, rounding up fractional parts of 0.5 or greater. Actual concentrations of 9.5 and 35.5 ppm or greater are necessary for an exceedance to be counted toward a violation.

