

(Caravati et al. 1988; Koren et al. 1991). After CO poisonings associated with mean COHb of 21% (range 13-32%) irreversible neurotoxic effects resulting in defects in the cognitive development and in behavioral alterations were observed in a long-term followup study, especially in young children (mean COHb 21%) (Klees et al. 1985). Acute symptoms of CO poisoning in children include effects, such as nausea, vomiting, headache and lethargy. These symptoms were reported to occur already at a COHb of 7% in one study (Klasner et al. 1998), while in another study a threshold of 16.7-19.8% COHb was found (Crocker and Walker 1985). Visual symptoms and syncope occurred at a threshold of 24.5% COHb, at higher COHb every child experienced at least one syncope (Crocker and Walker 1985).

3. ANIMAL TOXICITY DATA

3.1. Acute Lethality

Lethality data for acute inhalation exposure have been reported for rats, mice, and guinea pigs. The lethality data are summarized in Table 2-12 and graphically presented in Figure 2-1.

3.1.1. Rats

E.I. du Pont de Nemours and Co. (1981) determined LC₅₀ values for male Crl:CD rats (weight 250 ± 25 g) at exposure times of 5, 15, 30, and 60 min. The experiment was performed in duplicate with one set of animals exposed head only to the test gas, while the other set was unrestrained inside a 175-liter rectangular exposure chamber. In restrained rats, respiration rate was monitored by recording pressure fluctuations due to breathing in a body plethysmograph. During CO exposures, the chamber atmosphere was monitored continuously for oxygen (BioMarine Industries model 225 oxygen meter), CO₂ and CO (InfraRed Industries model 702-D nondispersive analyzer) using infrared analyzers. Blood from CO-exposed rats that died during or within 30 min of exposure was collected by cardiac puncture. The blood was measured for hemoglobin, COHb and oxyhemoglobin by an Instrumentation Laboratories model 282 CO-Oximeter. The post-exposure observation period was 14 days during which time body weights were monitored.

Nearly all the deaths occurred during the exposure period; of all animals that died, only 2 of 216 restrained and 3 of 148 unrestrained rats died after the exposure period. The authors reported LC₅₀ values for the 5-, 15-, 30-, and 60-min exposure periods for the unrestrained rats at 10,151 ppm (95% C.I., 9,580-10,953 ppm), 5,664 ppm (95% C.I., 5,218-6,078 ppm), 4,710 ppm (95% C.I., 4,278-5,254 ppm), and 3,954 ppm (95% C.I., 3,736-4,233 ppm), respectively.