HP 152a

Aerosol Propellant

Toxicity Summary for 1,1-Difluoroethane; Hydrofluorocarbon (HFC-152a)

Technical Information

Hydrofluorocarbon 152a has a low order of toxicity on both an acute and chronic basis. Although a TLV® has not been established for HFC-152a, a value of 1,000 ppm (v/v; 8-hour TWA) seems appropriate based on its low toxicity and analogy to other fluorocarbons.

The main physiological action of HFC-152a is that of "weak anesthesia" at high levels. Its 4-hour Approximate Lethal Concentration (ALC) in rats is 383,000 ppm[1]. Like other halocarbons and hydrocarbons under gross misuse or abuse conditions, HFC-152a is capable of sensitizing the heart to the body's own adrenaline. However, even in experimental screening studies using dogs and simulating stress with a large intravenous dose of adrenaline, cardiac sensitization was not observed at exposure levels below 150,000 ppm[2].

In a sub-chronic inhalation study[3], rats were exposed to HFC-152a at 100,000 ppm for 16 hours daily for 2 months with no adverse effects except for microscopic evidence of slight respiratory irritation. In a more recent study[1], when rats were exposed at 100,000 ppm for 6 hours/day, 5 days/week for 2 weeks, there were no significant effects relative to clinical, hematological, blood chemistry, urine analytical, or histopathological indices.

A lifetime inhalation toxicity study[4] has also been conducted on HFC-152a. Rats (120 #/sex/exposure level) were exposed for 6 hours/day, 5 days/week for 24 months to 0, 2,000, 10,000 or 25,000 ppm. Under the conditions of this experimental study, HFC-152a was not carcinogenic and produced no life-shortening toxic effects in rats exposed by inhalation for 24 months at concentrations ≤ 25,000 ppm (v/v).

In a study[5] designed to determine reproductive toxicity potential, groups of 27 pregnant rats were exposed by inhalation to 5,000 or 20,000 ppm HFC-152a for 6 hours/day on days 6-15 of gestation. There was no evidence of maternal toxicity, embryo toxicity, or teratogenicity under these experimental conditions. In another study[6] (Ames Test) designed to screen for mutagenic potential, HFC-152a was not mutagenic in *Salmonella typhimurium* bacteria, with or without metabolic activation.

In conclusion, based on acute and chronic animal toxicity studies and many years of human experience, HFC-152a at or below an occupational limit (8-hour TWA) of 1,000 ppm should pose no hazard relative to general toxicity, carcinogenicity, mutagenicity or teratogenicity. This fluorocarbon exhibits a very low degree of reactivity in biological systems.

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References

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5. Unpublished DuPont Haskell Laboratory Data, 1979.
6. Longstaff, E., et al. *Toxicol. Appl. Pharmacol*. 72: 15-31, 1984.

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