

## **10. WEIGHT OF EVIDENCE**

### **10.1. EVALUATION**

1,3-Butadiene is a colorless, odorless chemical that exists in ambient air in gaseous form. This extremely volatile chemical is very slightly soluble in water and is not found in soil and food. Thus, exposure to 1,3-butadiene is mainly via inhalation. Increased mortality from leukemias and lymphomas was observed among male workers occupationally exposed to 1,3-butadiene in polymer and monomer production, respectively. No information is available in females. The data from one Canadian and seven U.S. polymer production plants show that exposure to 1,3-butadiene is causally associated with occurrence of leukemias (cell type is not known at this time).

Two lifetime inhalation studies in mice and one lifetime inhalation study in rats found occurrence of malignant tumors in multiple sites in both mice and rats. Increased occurrence of lymphomas in a 1-year inhalation study in Swiss mice indicated that the presence of retrovirus was not an essential factor for the development of 1,3-butadiene-induced lymphomas.

Once inhaled, 1,3-butadiene is distributed throughout the body. The relative distribution of 1,3-butadiene in different organs is unknown at this time. 1,3-butadiene is metabolized by oxidation to a monoepoxide, diepoxide, and epoxy diol. Which metabolite(s) is responsible for the causation of cancer is still uncertain. Differences in measured concentration levels of these metabolites in mice and rats do not provide an explanation for the differences observed in malignancies in these two species. All three of these metabolites have been shown to be mutagenic in vivo and in vitro.

### **10.2. CONCLUSION**

Based on the overall evidence from human, animal, and mutagenicity studies, 1,3-butadiene is concluded to be a known human carcinogen.