FACT SHEET

Isoprene

CAS Number: 78-79-5

This fact sheet provides a summary of the Development Support Document (DSD) created by the TCEQ Toxicology Division (TD) for the development of Regulatory Guidelines (ESLs, AMCVs and ReVs) for ambient exposure to this chemical. For more detailed information, please see the DSD or contact the TD by phone (1-877-992-8370) or e-mail (tox@tceq.texas.gov).

What is isoprene?

Isoprene is the 2-methyl analogue of 1,3-butadiene. Isoprene may be produced synthetically or naturally. Naturally occurring isoprene is produced by plants, animals, and bacteria. It is the underlying structure of isoprenoid biochemicals, such as cholesterol, carotenoids, and vitamin A. Synthetic isoprene is used largely in the manufacturing of synthetic rubber, as well as in the manufacturing of styrene-isoprene-styrene block co-polymers and butyl rubber, in the production of hydrocarbon resins, and for the synthesis of terpenes.

How is isoprene released into ambient air?

Anthropogenic sources of isoprene include petroleum cracking, ethylene production (by-product), wood pulp production, oil fires, tobacco smoke, and automobile exhaust. Natural sources include isoprene produced naturally by plants, animals, and bacteria, which far exceeds that which is produced synthetically. Greater than 200 different plant species, especially trees, emit isoprene. In human breath, isoprene has been found to be one of the main endogenous compounds, accounting for up to 70% of exhaled hydrocarbons.

How can isoprene affect my health?

Isoprene has a relatively low order of toxicity. Permitted levels of isoprene should not cause adverse health or welfare effects. Laboratory animal studies have shown that breathing significantly high concentrations of isoprene for a sufficient exposure duration can adversely affect the respiratory system, body weight (maternal and fetal), organ weight, the central nervous system, and other health endpoints, such as blood cell counts, as well as increase the risk of certain tumors (liver cancer).

Is isoprene odorous or harmful to plants?

Isoprene is described as having a mild aromatic odor. Isoprene has not been shown to have adverse effects on plants; in fact, isoprene emissions are naturally produced by plants.

Why does the TCEQ set Regulatory Guidelines for isoprene?

The TCEQ has set various air quality guideline levels (ESLs, AMCVs and ReVs) to protect human health and welfare. Please Definitions of ESLs, ReVs, and AMCVs located on the TCEQ DSD

webpage for more information. The air quality guideline levels for isoprene have been designed to protect the general public from short-term and long-term adverse health and welfare effects. The general public includes sensitive populations such as children, the elderly, pregnant women and people with preexisting health conditions. If you would like to know more about the specific ESLs, AMCVs and ReVs developed, what the values are and what they are used for, please see the DSD.