FACT SHEET

Ethylene Oxide

CAS Number: 75-21-8

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

What is ethylene oxide?

Ethylene oxide (EtO) is used as a chemical intermediate in the manufacture of ethylene glycol (antifreeze), polyester, detergents, polyurethane foam, solvents, medicine, adhesives, and other products. The conversion of EtO to ethylene glycols represents a major use for EtO in the US. Although relatively small amounts of EtO are used for sterilization, more than 20 billion medical devices sold in the U.S. every year are sterilized with EtO, accounting for approximately 50 percent of the medical devices that require sterilization.

How is EtO released into ambient air?

The general population may be exposed to EtO through breathing ambient air containing EtO, smoking tobacco products, and breathing secondhand cigarette smoke. EtO is also normally produced endogenously in the body due to the oxidation of ethylene. Sources of EtO emissions into the air include, but are not limited to, industrial emissions or venting with other gases. Other sources of EtO air emissions include its use as a sterilizer of medical equipment and its release from commodity-fumigated materials (such as spices and cosmetics).

How can EtO affect my health?

Permitted levels of EtO should not cause adverse health effects. Some workers exposed to long-term air concentrations of EtO up to millions of times higher than environmental levels have experienced increased cancer risk, particularly for lymphoid cancers, while other highly-exposed workers have not. The carcinogenic potential of EtO, however, has been confirmed by its ability to mutate DNA and in long-term laboratory animal studies at high EtO exposure concentrations. As a result, the TCEQ has classified EtO as likely to be carcinogenic to humans.

Why does the TCEQ set Regulatory Guidelines for EtO?

The TCEQ sets various air quality guideline levels (ESLs, AMCVs, and ReVs) to protect human health and welfare. Please see Definitions of ESLs, ReVs, and AMCVs located on the TCEQ final DSD webpage for more information. The TCEQ air quality guideline level (i.e., long-term ESL) for EtO has been designed to protect the general public (including sensitive populations such as

children, the elderly, pregnant women, and people with preexisting health conditions) from the potential long-term carcinogenic effects of EtO exposure. If you would like to know more about the specific ESLs, AMCVs and ReVs developed for EtO, what the values are, and what they are used for, please consult the DSD.