FACT SHEET

Manganese and Inorganic Compounds

CAS Registry Number: 7439-96-5

(Please see the manganese development support document for a list of applicable manganese compounds)

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 manganese?

Manganese is a naturally occurring metal. Pure manganese is silver-colored, but does not occur naturally. Manganese combines with other substances such as oxygen, sulfur, or chlorine. It occurs naturally in most foods and may be added to some foods. Manganese is used principally in steel production to improve hardness, stiffness, and strength, and may also be used as an additive in gasoline to improve the octane rating of the gas (ATSDR 2012).

How are manganese and inorganic manganese compounds released into ambient air?

Although a primary exposure pathway for manganese is the diet (e.g., foods rich in manganese include grains, beans nuts, tea), it may also be released into the air. The main sources of manganese release to the air are industrial emissions, the combustion of fossil fuels, and manganese emanating from soils. The principal sources of industrial emissions are ferroalloy production and iron and steel foundries, and the principal sources of combustion emissions are power plants and coke ovens. Atmospheric emissions of manganese and other trace metals from these industrial sources have declined over the last two decades due to the use of advanced pollution control devices and increased government regulations regarding these emissions. Windblown erosion of dusts and soils is also an important atmospheric source of manganese (ATSDR 2012).

How can manganese and inorganic manganese compounds affect my health?

Permitted levels of manganese should not cause short- or long-term adverse health or welfare effects. Exposing laboratory animals to much higher short-term levels of manganese can cause adverse respiratory effects such as an inflammatory response in the lung, which can lead to impaired lung function. The most sensitive effects due to exposure to short-term, significantly elevated concentrations are mild airway inflammatory changes in the absence of observed clinical signs. By contrast, neurological effects (e.g., abnormal eye-hand coordination) are the

most sensitive effects observed in some workers exposed repeatedly, long-term to sufficiently elevated manganese concentrations. Permitted levels protect the public (including potentially sensitive subpopulations) against all adverse health effects of manganese, including the most sensitive effects.

Are manganese and inorganic manganese compounds odorous to humans or harmful to plants?

Manganese is odorless and adverse effects to plants from manganese in the ambient air have not been documented.

Why does the TCEQ set Regulatory Guidelines for manganese and inorganic manganese compounds?

The TCEQ has set 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 DSD webpage for more information. The air quality guideline levels for manganese 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.