FACT SHEET

Cobalt and Cobalt Compounds

CAS Registry Number: 7440-48-4

(Please see the cobalt development support document for a list of applicable cobalt 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 cobalt?

Cobalt is the 33rd most abundant element and comprises approximately 0.0025% of the weight of the earth's crust. It is often found in association with nickel, silver, lead, copper, and iron ores and occurs in mineral form as arsenides, sulfides, and oxides. Cobalt commonly occurs in the 0, +2, and +3 valence states. A biochemically important cobalt compound is vitamin B_{12}, or cyanocobalamin, in which cobalt is complexed with four pyrrole nuclei.

How are cobalt and cobalt compounds released into ambient air?

Although the largest source of cobalt exposure for the general population is food (e.g., intake in the U.S. has been estimated to be 5-40 µg Co/day with relatively high concentrations in vegetables and fish), cobalt is also released into the atmosphere from both anthropogenic and natural sources. Emissions from natural sources are estimated to slightly exceed those from manufactured sources. Natural sources include windblown soil, seawater spray, volcanic eruptions, and forest fires. Primary anthropogenic sources include fossil fuel and waste combustion, vehicular and aircraft exhausts, processing of cobalt and cobalt-containing alloys, copper and nickel smelting and refining, and the manufacture and use of cobalt chemicals and fertilizers derived from phosphate rocks. Cobalt and cobalt compounds are nonvolatile and are emitted to the atmosphere in particulate form.

How can cobalt and cobalt compounds affect my health?

Permitted levels of cobalt should not cause short- or long-term adverse health or welfare effects. Some workers exposed to much higher short-term levels of cobalt have experienced respiratory irritation (e.g., coughing expectoration), and some exposed to much higher occupational concentrations for a sufficiently long duration have experienced respiratory irritation (i.e., eye, nose, and throat irritation, cough) and reduced lung function (e.g., decreased forced expiratory volume in 1 second and reduced maximum expiratory flow).

Additionally, an increase in lung tumors has been reported in laboratory animals chronically exposed to sufficiently high levels of cobalt. The TCEQ considers cobalt and cobalt compounds

as *Likely to Be Carcinogenic to Humans* via inhalation. Permitted levels protect the public (including potentially sensitive subpopulations) against all adverse health effects of cobalt, including the most sensitive effects.

Are cobalt and cobalt compounds odorous to humans or harmful to plants?

Cobalt and cobalt compounds are odorless and adverse effects to plants from cobalt in the ambient air have not been documented.

Why does the TCEQ set Regulatory Guidelines for cobalt and cobalt 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 cobalt 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.