FACT SHEET

Crystalline Silica

CAS Registry Numbers:
14808-60-7 (quartz)
14464-46-1 (cristobalite)
15468-32-3 (tridymite)

This fact sheet provides a summary of the Development Support Document (DSD) created by the Toxicology Division (TD) of the Texas Commission on Environmental Quality (TCEQ) for the development of Regulatory Guidelines (ESL 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.state.tx.us).

What is silica?

Silica is an off-white granule that occurs naturally in various crystalline and amorphous forms. Crystalline silica is characterized by silicon dioxide molecules oriented in fixed, periodic patterns to form stable crystals. Historically, silica has been primarily used to make glass and is a byproduct of agriculture. Silica is also used in ceramics, sandblasting, cleansers, and filtration and serves as filler in rubber, paints, and putty. Crystalline silica occurs in three primary forms: quartz , cristobalite, and tridymite. Silica is present in 255 industries, including mining, foundries, metallurgical operations, ceramics, cement, and glass industries, construction, sandblasting, agriculture, and denture manufacture.

How is silica released into ambient air?

Silica is released into ambient air from a variety of sources. Trace levels of silica can be identified in urban and suburban air as a fractional component of particulate emissions such as agricultural dust or from industries that use silica in their processes. Exposure to high concentrations of silica occurs primarily in the workplace.

How can silica affect my health?

Permitted levels of silica should not cause adverse health and welfare effects. Both human and laboratory animal studies indicate that lung inflammation occurs after short-term exposure and silicosis occurs after long-term inhalation exposure to high levels of silica.

Epidemiologic studies provide evidence of a causal association between silica exposure and the development of lung cancer. Silica has also been shown to cause lung cancer by the inhalation route of exposure in rats, but not mice and hamsters. As a result, the International Agency for Research on Cancer has classified silica in Group 1, as chemicals and groups of chemicals which are casually associated with cancer in humans. Silica has been classified as a known human carcinogen by NIOSH and the TCEQ.

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Is silica odorous or harmful to plants?
There are no odors associated with silica. Silica has not been shown to have adverse effects on plants.

Why does the TCEQ set Regulatory Guidelines for silica?
The TCEQ has set various air quality guideline levels (ESLs and ReVs) to protect human health and welfare. Please see the Regulatory Guideline Fact Sheet for more information on ESLs and ReVs. The ESLs and ReVs for silica have been designed to protect the general public from short-term and long-term adverse health and welfare effects. The general public includes children, the elderly, pregnant women, and people with pre-existing health conditions. If you would like to know more about the specific ESLs and ReVs developed, what the values are and what they are used for, please see the DSD.