ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

THORIUM
CAS # 7440-29-1

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This fact sheet answers the most frequently asked health questions (FAQs) about thorium. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Thorium is a radioactive substance that occurs naturally in the environment. It has been shown to cause an increase in cancers of the lung, pancreas, and blood in workers exposed to high levels of it in the air. This chemical has been found in at least 16 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is thorium?

Pronounced (thôr'ē-əm)

Thorium is a naturally occurring, radioactive substance. In the environment, thorium exists in combination with other minerals, such as silica. Small amounts of thorium are present in all rocks, soil, water, plants, and animals. Soil contains an average of about 6 parts of thorium per million parts of soil (6 ppm).

More than 99% of natural thorium exists in the form of thorium-232. It breaks down into two parts, a small part called "alpha" radiation and a large part called the decay product. The decay product is also not stable and continues to break down through a series of decay products until a stable product is formed. During these decay processes, radioactive substances are produced. These include radium and radon. These substances give off radiation, including alpha and beta particles, and gamma radiation.

Some rocks in underground mines contain thorium in a more concentrated form. After these rocks are mined, thorium is usually concentrated and changed into thorium dioxide or other chemical forms. After most of the thorium is removed, the rocks are called "depleted" ore or tailings.

Thorium is used to make ceramics, gas lantern mantles, and metals used in the aerospace industry and in nuclear reactions. Thorium can also be used as a fuel for generating nuclear energy.

What happens to thorium when it enters the environment?

- Thorium is a natural part of the environment.
- Thorium changes extremely slowly into other radioactive substances.
- It takes about 14 billion years for half of the thorium-232 to change into new forms.
- As rocks are broken up by wind and water, the thorium and all other components of the rocks become part of the soil.
- Thorium in soil can be washed into rivers and lakes.
- Windblown dust and volcanic eruptions are natural sources of thorium in the air.
- Burning coal may release small amounts of thorium into the air.
- Mining thorium or making products that contain it may also release thorium into the environment.

How might I be exposed to thorium?

- Just by being alive, everyone is exposed to small amounts of thorium in air, water, and food.