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SECONDARY VALUES FOR THALLIUM (CAS # 7440-28-0)

A search was conducted for information on the chemical properties and toxicity of thallium (to human health and to fish and aquatic life) using the following databases and search engines: ECOTOX (toxicity to fish and aquatic life), IRIS (Integrated Risk Information System; toxicity to human health), CHEMFATE (environmental fate), and the ATSDR website.

FISH AND AQUATIC LIFE

To derive an acute toxicity criterion for aquatic life, acute toxicity test results are required for at least one species in each of eight different families. To derive a secondary acute value, acute toxicity test results are required for a Daphnid species (at a minimum). However, the aquatic toxicity data currently available for a daphnid species (*Daphnia magna*) do not meet the minimum data requirements (not the right exposure duration, etc.). Therefore, it is not possible to calculate secondary values for the protection of fish and aquatic life at this time.

HUMAN HEALTH

To calculate a criteria or secondary value for the protection of human health, it is first necessary to determine if the substance has been shown to be carcinogenic (which will result in the calculation of a human cancer criteria or secondary value) or not (which will result in the calculation of a human threshold criteria or secondary value). Thallium is not currently listed in the IRIS database. However, several different forms of thallium are listed. All of these have been classified as "D", not classifiable, by the U.S. EPA, based on inadequate data. Oral reference doses are available as follows: $9x10^{-5}$ for the thallium acetate and thallium nitrate, and 8x10-5 for the thallium carbonate, thallium chloride, and thallium sulfate. In the past, an oral reference dose of $8.5x10^{-5}$ was used to derive a human threshold secondary value. The old spreadsheet says this oral reference dose was listed in IRIS (last updated in 1996), but this value and thallium itself are not currently listed. I have been unable to find a source for a log K_{ow} (with which to calculate at human health BAF), and none is listed in the old threshold secondary value spreadsheet. However, EPA's 1993 document lists a human health BAF (67) for thallium that was derived using a food chain multiplier and a BCF. This is what was used in the past to derive a human threshold secondary value, and what would be used today. Therefore, the human threshold secondary value that was derived in the past for thallium would not change today.

Non-public water supply/warm water sport fish: 3.5 µg/L