



by James B. Hedrick

THORIUM IN THE UNITED STATES

Primary Minerals: Monazite — rare earth - thorium phosphate
Thorite — thorium-uranium silicate

Monazite has been the primary source of the world's thorium

Thorium derived from monazite was recovered as a primary product until World War II and used in camping lamp mantles

After World War II, monazite was mined primarily for its rare-earth content and only minor amounts of thorium was used - most discarded as waste

Thorite has been a source of uranium, especially the uranium-rich variety uranothorite

An orange-colored calcium-rich thorite variety is orangite

THORIUM MINERALS

Primary Minerals:

Monazite — rare earth - thorium phosphate

Hardness: 5 to 5.5

Color: Yellowish, reddish brown to brown; shades of green, nearly white; yellowish brown, yellow



Thorite — thorium-uranium silicate

Hardness: 4.5

Color: Yellow, yellow-brown, red-brown, green, orange to black



THORIUM MINERALS


Imports of Thorium Compounds (metric tons ThO₂)

2005	2006	2007	2008	2009 ^e
3.65	36.0	4.71	0.51	2.00

Exports of Thorium Compounds (metric tons ThO₂)

0.55	0.81	1.21	9.35	3.80
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THORIUM TRADE



Trade Tariffs for Thorium (metric tons ThO₂)

Trade Item	Number	Normal Trade Relations
Thorium ores and concentrates (monazite or thorite)	2612.20.0000	Free
Thorium compounds (thorium oxide and thorium nitrate)	2844.30.1000	5.5% ad valorem



THORIUM TRADE

Thorium Oxide
(per kilogram, 99.99% purity)

2005	2006	2007	2008	2009
\$107.25	\$175.00	\$200.00	\$200.00	\$300.00

Thorium Nitrate
(per kilogram, mantle grade)

\$27.00	\$27.00	\$27.00	\$27.00	\$27.00
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Source: Rhodia Electronics & Catalysis

THORIUM PRICES

U.S. Tax Code

Monazite: 22% on thorium content, 14% on rare-earth and yttrium content (Domestic) and 14% (Foreign)

Thorite: 22% on thorium content, 22% on uranium content (Domestic) and 14% (Foreign)

While two temporary federal income tax acts were passed prior to 1900, the Corporate Franchise Act of 1909 marks the beginning of continuous corporate income taxation in this country. This act levied a corporation franchise tax of 1% on net income. Definitions of gross income, net income, allowable deductions and other critical items were not clear and resulted in confusion.

A group of metal miners were among the first to challenge the Act, contending that they were entitled, on constitutional grounds, to a tax deduction to recover their investments in mining properties (i.e., a depletion allowance). The Corporate Franchise Act of 1909 carried no such provision. The miners argued that if they were unable to recover their investments solely due to federal taxation, this would amount to unconstitutional confiscation. Although the Supreme Court ruled against the miners at that time, the first general Revenue Act of 1913, and each of the over 25 federal income tax acts since then, have contained provisions for depletion of wasting assets.

THORIUM DEPLETION ALLOWANCE

Reserves

(metric tons ThO₂)

United States	440,000
Australia	300,000
Brazil	16,000
Canada	100,000
India	290,000
Malaysia	4,500
South Africa	35,000
Other Countries	<u>90,000</u>
World Total	1,300,000

THORIUM RESERVES

Mining of thorium minerals

(metric tons, gross weight)

2007^{est}

United States	None	(Last mined in 1994)
Australia	None	
Brazil	1,173	
Canada	None	
India	5,000	
Malaysia	800	
South Africa	None	
Other Countries	<u>None</u>	
World Total	6,970	(thorium content of 6-8%)

THORIUM MINING