DESCRIPTIVE MODEL OF RHYOLITE-HOSTED Sn

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APPROXIMATE SYNONYM Mexican-type.

DESCRIPTION Cassiterite and wood tin in discontinuous veinlets in rhyolite flow-dome complexes and derivative placers (see fig. 128).

GENERAL REFERENCES Lee-Moreno (1980), Huspeni and others (1984).

GEOLOGICAL ENVIRONMENT

Rock Types Alkali-feldspar rhyolite with SiO_2 >75 percent; includes topaz rhyolites of Burt and others (1982) and Christiansen and others (1983). Distinctive accessory minerals may include topaz, fluorite, bixbyite, pseudobrookite, and beryl. Petrochemical signature similar to Climax Mo.

Textures Crystal-poor (5 percent) to crystal-rich (50 percent) rhyolite with quartz and sanidine phenocrysts; rare fayalite, biotite, or hornblende may be present.

Age Range Tertiary; chiefly Oligocene and Miocene.

Depositional Environment Rhyolite flow-dome complexes and related pyroclastic and epiclastic rocks.

Tectonic Setting(s) Silicic volcanic fields, generally in areas of thick continental crust.

Associated Deposit Types None are known, but based on geochemical similarity of associated magmas, these may be a surface expression of Climax Mo.

DEPOSIT DESCRIPTION

Mineralogy Cassiterite (including wood tin) plus hematite (characteristically specularite) ± cristobalite, fluorite, tridymite, opal, chalcedony, beudantite, mimetite, adularia, durangite, and zeolite minerals.

Texture/Structure Most commonly as 0.1- to 10-cm-wide discontinuous veins and veinlets whose other dimensions seldom exceed 75 m. These veins and veinlets may be clustered in zones of somewhat greater dimension. Cassiterite also occurs as disseminations in the matrix of rhyolite flows or fault breccias. These two types of deposits are part of a continuum.

Alteration May be absent; tin may or may not occur in large areas of vapor-phase alteration (tridymite, sanidine, hematite, ± pseudobrookite); alteration directly associated with mineralization may include cristobalite, fluorite, smectite, kaolinite, and other clay minerals.

Ore Controls Deposits are generally in the fractured and brecciated outer parts of flow-dome complexes where permeability is high.

Weathering Weathering is generally minor, but a translucent red-orange clay mineral (smectite) is present in most deposits.

Geochemical Signature Dispersion of associated elements (Sri, Fe, Be, Li, F, As, Sb, Pb, Zn, Bi, REE) in rock is minimal. Best exploration guide is presence of high concentrations of tin (>1,000 ppm) in pan concentrate samples. Cassiterite in stream sediments is usually restricted to within 2-3 km of tin deposits.

Examples

Black Range, USNM	(Fries, 1940; Lufkin, 1972)
Mexico deposits	(Foshag and Fries, 1942; Smith and others, 1950; Ypma and Simons, 1969; Pan, 1974; Lee-Moreno, 1980)

GRADE AND TONNAGE MODEL OF RHYOLITE-HOSTED Sn

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COMMENTS See figs. 129-130.

DATA REFERENCES Bracho (1960, 1961).

COMMENTS Grade and tonnage estimates were based on reserves. Tonnage is significantly correlated with tin grades (r = 0.36).

DEPOSITS

Name	Country
ArguililhS	MXCO
Amigos	MXCO
Arrieros #2	MXCO
Arrieros #3	MXCO
Arrieros #4	MXCO
Arroyo Durango	MXCO
Castrita	MXCO
Catas de las Vacas	MXCO
Catas el Durango	MXCO
Cerro Blanco	MXCO
Cerro Grande	MXCO
Cerro Prieto, La Quemada, La Colocion	MXCO
Chavarria	MXCO
Cordon Estaneros	MXCO
Don Teodoro	MXCO
El Abra	MXCO
El Atascadero	MXCO
El Baluarte	MXCO
El Barroso	MXCO
El Borrego #1	MXCO
El Borrego #2	MXCO
El Calabrote	MXCO
El Capulin	MXCO
El Coloradillo	MXCO
El Corral	MXCO
El Cristal	MXCO
El Dorado	MXCO
El Duraznil10	MXCO
El Durazno (El Aguila)	MXCO
El Durazno (Juan Aldama)	MXCO
El Encino	MXCO
El Gotera	MXCO
El Huacal	MXCO
El Indio, El Plieto, Tadeo, San Antonio	MXCO
El Ladril10	MXCO
El Mamey	MXCO
El Naranjo, Buena Suerte	MXCO
El Noladero	MXCO
El Nepal (Juan Aldama)	MXCO
El Nepal (La Ochoa)	MXCO
El Penasco	MXCO
El PerdLdo	MXCO
El Picacho	MXCO
El Pleito	MXCO
El Polvillo	MXCO
El Profesor	MXCO
El Romadizo	MXCO
El Santo Nino	MXCO
El Socavon #4	MXCO
El Socavon #5	MXCO
El Socavon #6	MXCO
El Socavon #7	MXCO
El Socavon #8	MXCO
El Tarango	MXCO
El Venado	MXCO
El Zanzon	MXCO
Galvan	MXCO
GavilancillOS	MXCO
Grupos 1 & 2-Vendo W	MXCO
Grupos 3 & 4	MXCO
Guadalupe	MXCO
HierbaniZ	MXCO
La Chapeteada	MXCO
La Chililla	MXCO
La Chinche	MXCO
La Chorrera	MXCO
La Cinta Corrida	MXCO
La CocOna	MXCO
La Desparramada	MXCO
La Escondida	MXCO
La Esperanza (El Aguila)	MXCO
La Esperanza (La Ochoa)	MXCO
La Esperanza (Los Angeles)	MXCO
La Estrella	MXCO
La Guera	MXCO
La Hormiga	MXCO
La Huacalona	MXCO
La Leona	MXCO
La Loba	MXCO
La Liendre	MXCO
La Mula	MXCO
La Polvosa	MXCO
La Puntilla	MXCO
Las Aguilas	MXCO
Las Amarillas	MXCO
Las CalaVeras	MXCO
Las Flores	MXCO
Las Fundiciones	MXCO
Las Marias	MXCO
Las Pegazones	MXCO

Las Perlitas	MXCO	Mina del Aire	MXCO
Las Tablas	MXCO	Mina Dura	MXCO
La Triste	MXCO	Palo Colorado	MXCO
La Venadita	MXCO	Panchillo	MXCO
La Vibora	MXCO	Plan de Tecolotes	MXCO
La Victoria	MXCO	Potrero del Molino	MXCO
La Vieja-El Agua	MXCO	San Francisco	MXCO
Leoncitos	MXCO	San Humberto	MXCO
Loreto	MXCO	San Juanera	MXCO
Los Angeles	MXCO	San Rafael	MXCO
Los Arrieros	MXCO	San Ruperto	MXCO
Los Caballos	MXCO	Santa Efigenia	MXCO
Los Campamentos #1	MXCO	Santa Gertrudis	MXCO
Los Campamentos #2	MXCO	Santa Leonor	MXCO
Los Campamentos #3	MXCO	Santa Lucia	MXCO
Los Cuatillos	MXCO	Socorro-Guadalupe	MXCO
Los Garcia	MXCO	Sombreretillo	MXCO
Los Lobos	MXCO	Soto	MXCO
Los Pinacates	MXCO	Tecolotes	MXCO
Manga de Lopez	MXCO	Tolano	MXCO
Manzanillas	MXCO	Veta Blanca	MXCO
Metal Negro	MXCO		

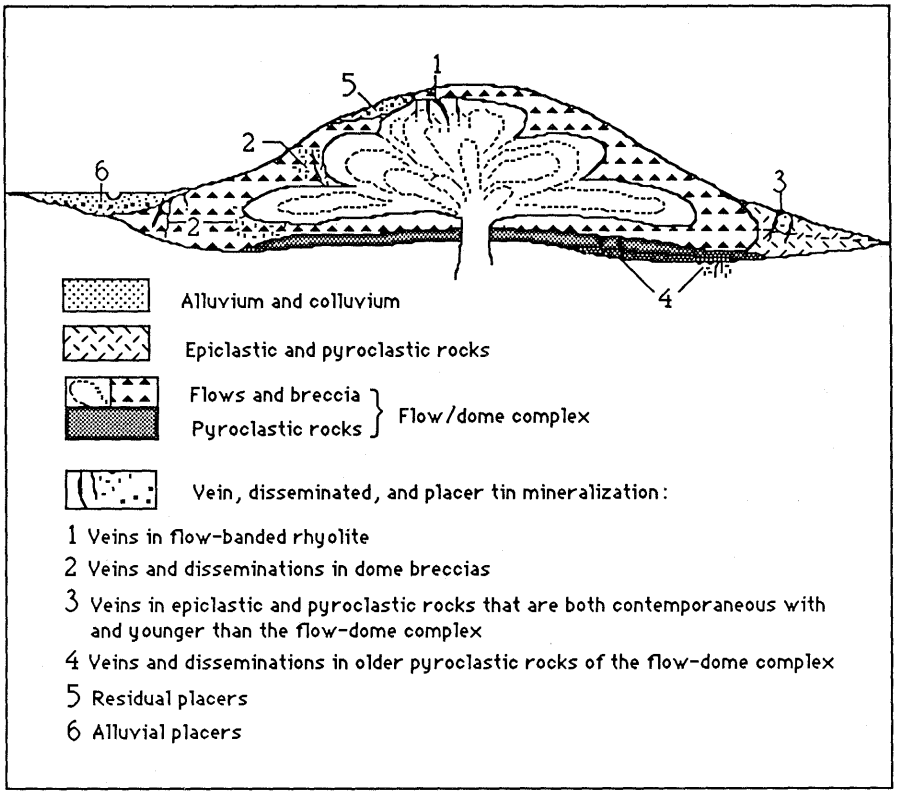

Figure 128. Cartoon cross section of rhyolite-hosted Sn deposit showing relationship of cassiterite concentrations to rhyolite dome.

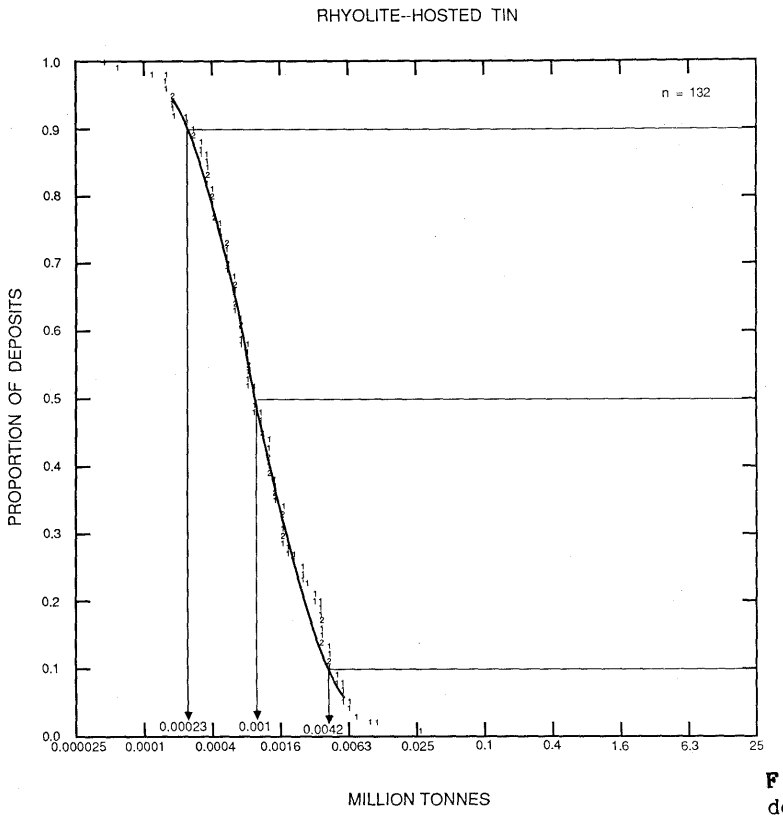

Figure 129. Tonnages of rhyolite-hosted Sn deposits. Individual digits represent number of deposits.

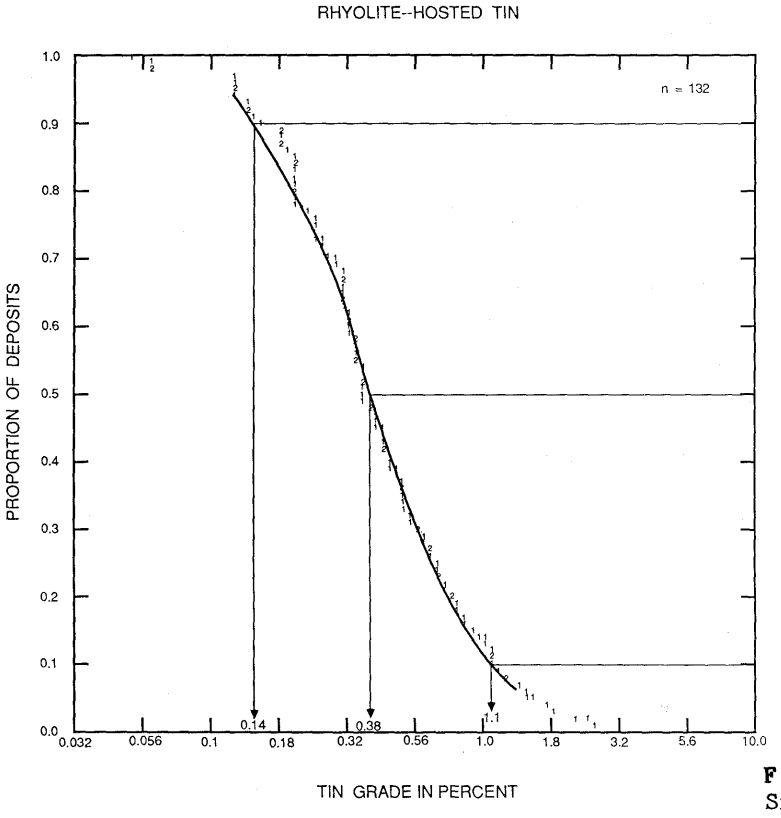

Figure 130. Tin grades of rhyolite-hosted Sn deposits. Individual digits represent number of deposits.