

DESCRIPTIVE MODEL OF PORPHYRY CU, SKARN-RELATED DEPOSITS

By Dennis P. Cox

DESCRIPTION Chalcopyrite in stockwork veinlets in hydrothermally altered intrusive and in skarn with extensive retrograde alteration (see fig. 50).

GENERAL REFERENCE Einaudi and others (1981), p. 341-354.

GEOLOGICAL ENVIRONMENT

Rock Types Tonalite to monzogranite intruding carbonate rocks or calcareous elastic rocks.

Textures Porphyry has microaplitic groundmass.

Age Range Mainly Mesozoic and Tertiary, but may be any age.

Depositional Environment Epizonal intrusion of granitic stocks into carbonate rocks. Intense fracturing.

Tectonic Setting(s) Andean-type volcanism and intrusion superimposed on older continental shelf carbonate terrane.

Associated Deposit Types Skarn copper, replacement Pb.Zn-Ag.

DEPOSIT DESCRIPTION

Mineralogy Chalcopyrite + pyrite + magnetite in inner garnet pyroxene zone; bornite + chalcopyrite + sphalerite + tennantite in outer wollastonite zone, Scheelite and traces of molybdenite and galena may be present. Hematite or pyrrhotite may be predominant.

Texture/Structure Fine granular talc-silicates and quartz sulfide veinlets.

Alteration Potassic alteration in pluton is associated with andradite and diopside in calcareous rocks. Farther from contact are zones of wollastonite or tremolite with minor garnet, idocrase, and clinopyroxene. These grade outward to marble. Phyllic alteration in pluton is associated with retrograde actinolite, chlorite, and clay in skarn.

Ore Controls Intense stockwork veining in igneous and skarn rocks contains most of the copper minerals. Cu commonly accompanies retrograde alteration.

Weathering Cu carbonates, silicates, Fe-rich gossan.

Geochemical Signature Cu, Mo, Pb, Zn, Au, Ag, W, Bi, Sn, As, Sb.

EXAMPLES

Ruth,(Ely), USNV	(Westra, 1982a)
Gaspe, CNQU	(Allcock, 1982)
Christmas, USAZ	(Koski and Cook, 1982)
Silver Bell, USAZ	(Graybeal, 1982)

GRADE AND TONNAGE MODEL OF PORPHYRY Cu, SKARN-RELATED DEPOSITS

By Donald A. Singer

DATA REFERENCES Einaudi and others (1981), Einaudi (1981).

COMMENTS Skarn copper deposits associated with porphyry copper deposits are included in this model. Tonnages and grades attributable to skarn were estimated for some deposits from estimated proportions of skarn provided by Einaudi and others (1981) and Einaudi (1981). See figs. 54-56.

DEPOSITS

<u>Name</u>	<u>Country</u>	<u>Name</u>	<u>Country</u>
Cananea (Capote)	MXCQ	Gold Coast	PPNG
Carr Fork	USUT	Lakeshore	USAZ
Christmas	USAZ	Lyon	USNV
Continental	USNM	Pima-Mission	USAZ
Copper Basin (Battle Mt. D.)	USNV	Potrerrillos	CILE
Copper Canyon	USNV	Recsk	HUNG
Craigmont	CNBC	Santa Rita	USNM
Ely	USNV	Silver Bell	USAZ
Gaspe (Needle Mountain)	CNQU	Twin Buttes	USAZ

PORPHYRY COPPER--SKARN--RELATED

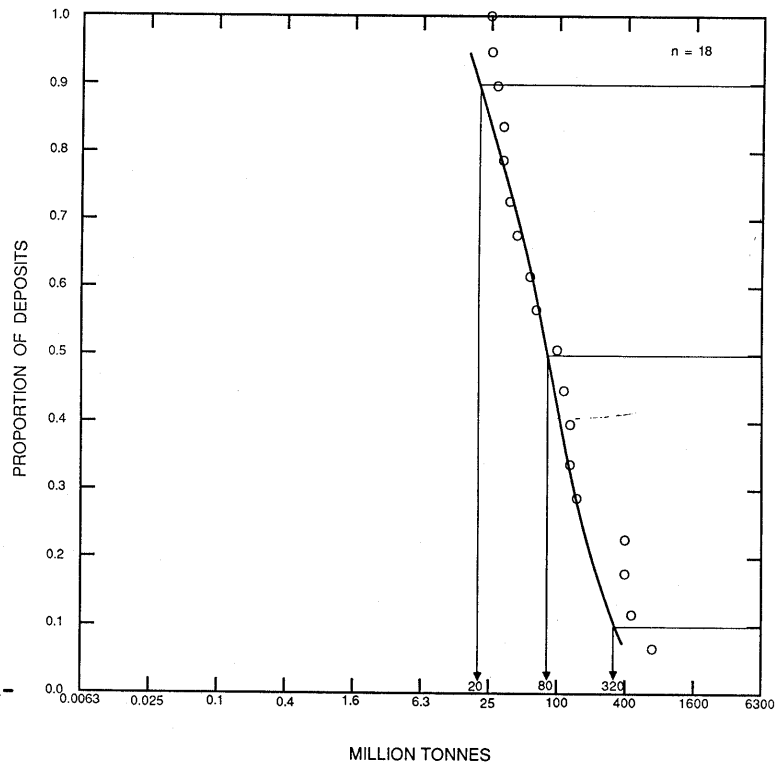


Figure 54. Tonnages of porphyry Cu-skarn-related deposits.

PORPHYRY COPPER--SKARN--RELATED

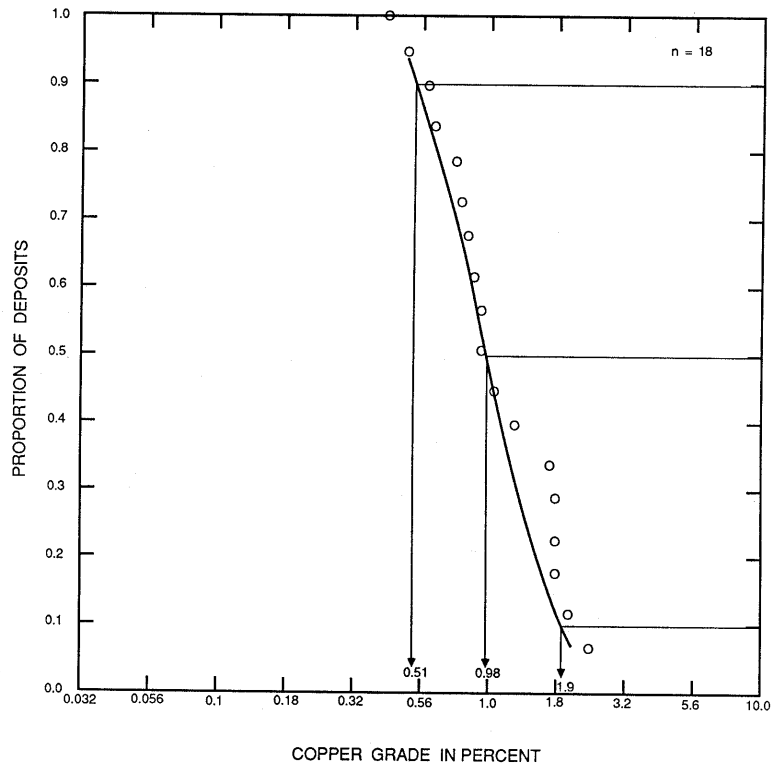


Figure 55. Copper grades of porphyry Cu-skarn-related deposits.

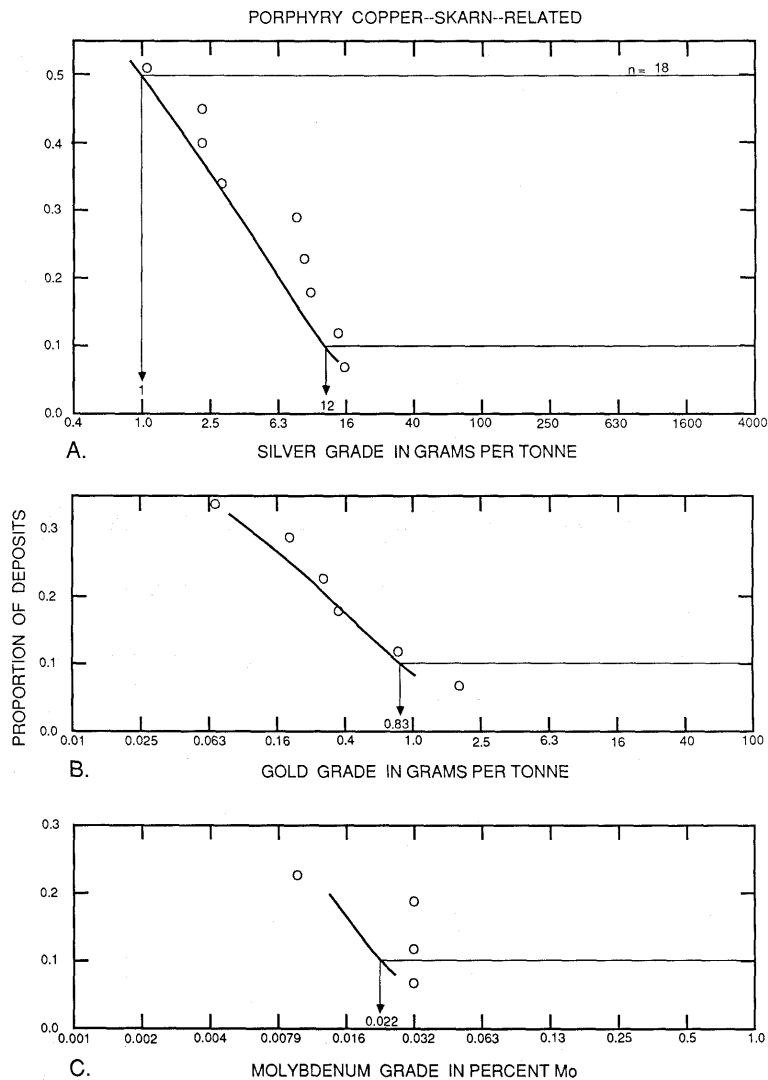


Figure 56. By-product grades of porphyry Cu-skarn-related deposits. A, Silver. B, Gold. C, Molybdenum.