

DESCRIPTIVE MODEL OF CYPRUS MASSIVE SULFIDE

By Donald A. Singer

APPROXIMATE SYNONYM Cupreous pyrite.DESCRIPTION Massive pyrite, chalcopyrite, and sphalerite in pillow basalts (see figs. 95, 96).GENERAL REFERENCE Franklin, and others (1981).GEOLOGICAL ENVIRONMENTRock Types Ophiolite assemblage: tectonized dunite and harzburgite, gabbro, sheeted diabase dikes, pillow basalts, and fine-grained metasedimentary rocks such as chert and phyllite (fig. 95).Textures Diabase dikes, pillow basalts, and in some cases brecciated basalt.Age Range Archean(?) to Tertiary--majority are Ordovician or Cretaceous.Depositional Environment Submarine hot spring along axial grabens in oceanic or back-arc spreading ridges. Hot springs related to submarine volcanoes producing seamounts (fig. 96).Tectonic Setting(s) Ophiolite. May be adjacent to steep normal faults.Associated Deposit Types Mn and Fe-rich cherts regionally.DEPOSIT DESCRIPTIONMineralogy Massive: pyrite + chalcopyrite + sphalerite ± marcasite ± pyrrhotite. Stringer (stockwork): pyrite + pyrrhotite, minor chalcopyrite and sphalerite (cobalt, gold, and silver present in minor amounts).Texture/Structure Massive sulfides (>60 percent sulfides) with underlying sulfide stockwork or stringer zone. Sulfides brecciated and recemented. Rarely preserved fossil worm tubes.Alteration Stringer zone--feldspar destruction, abundant quartz and chalcedony, abundant chlorite, some illite and calcite. Some deposits overlain by ochre (Mn-poor, Fe-rich bedded sediment containing goethite, maghemite, and quartz).Ore Controls Pillow basalt or mafic volcanic breccia, diabase dikes below; ores rarely localized in sediments above pillows. May be local faulting.Weathering Massive limonite gossans. Gold in stream sediments.Geochemical Signature General loss of Ca and Na and introduction and redistribution of Mn and Fe in the stringer zone.EXAMPLES

Cyprus deposits, CYPS	(Constantinou and Govett, 1973)
Oxec, GUAT	(Petersen and Zantop, 1980)
York Harbour, CNNF	(Duke and Hutchinson, 1974)
Turner-Albright, USOR	(Koski and Derkey, 1981)

GRADE AND TONNAGE MODEL OF CYPRUS MASSIVE SULFIDE

By Donald A. Singer and Dan L. Mosier

DATA REFERENCE Mosier and others (1983).COMMENTS Massive sulfide deposits from Mosier and others (1983) which had only mafic or ultramafic rocks immediately above through 500 m below, and had either pillow basalt or diabase dikes in the sequence were included in these plots. See figs. 97-99.

DEPOSITS

<u>Name</u>	<u>Country</u>	<u>Name</u>	<u>Country</u>
Aarja	OMAN	Lasail	OMAN
Agrokipia	CYPS	Limni	CYPS
Ambelikou	CYPS	Little Bay	CNNF
Ana Yatak-Ergani	TRKY	Lokken	NRWY
Apliki	CYPS	Lorraine	PLPN
Arinteiro	SPAN	Mathiati North	CYPS
Bama	SPAN	Mavrovouni	CYPS
Barlo	PLPN	Mousoulos-Kalavasos	CYPS
Bayda	OMAN	Ny Sulitjelma	NRWY
Betts Cove	CNNF	Oxec	GUAT
Big Mike	USNV	Peravasa	CYPS
Bonanza	CNBC	Platies	CYPS
Bongbongan	PLPN	Rendall-Jackson	CNNF
Carawison	PLPN	Rua Cove	USAK
Carmel	PLPN	Sha	CYPS
Colchester	CNNF	Siirt Madenkoy	TRKY
Fornas	SPAN	Skorovass	NRWY
Hand Camp	CNNF	Skouriotissa	CYPS
Huntingdon	CNQU	Svano	NRWY
Kapedhes	CYPS	Tilt Cove	CNNF
Kokkinoyia	CYPS	Troulli	CYPS
Kokkinopezoula	CYPS	Turner-Albright	USOR
Kure (Asikoy)	TRKY	Whalesback-Little Deer	CNNF
Kure (Bakibaba)	TRKY	York Harbour	CNNF
Kynousa	CYPS		

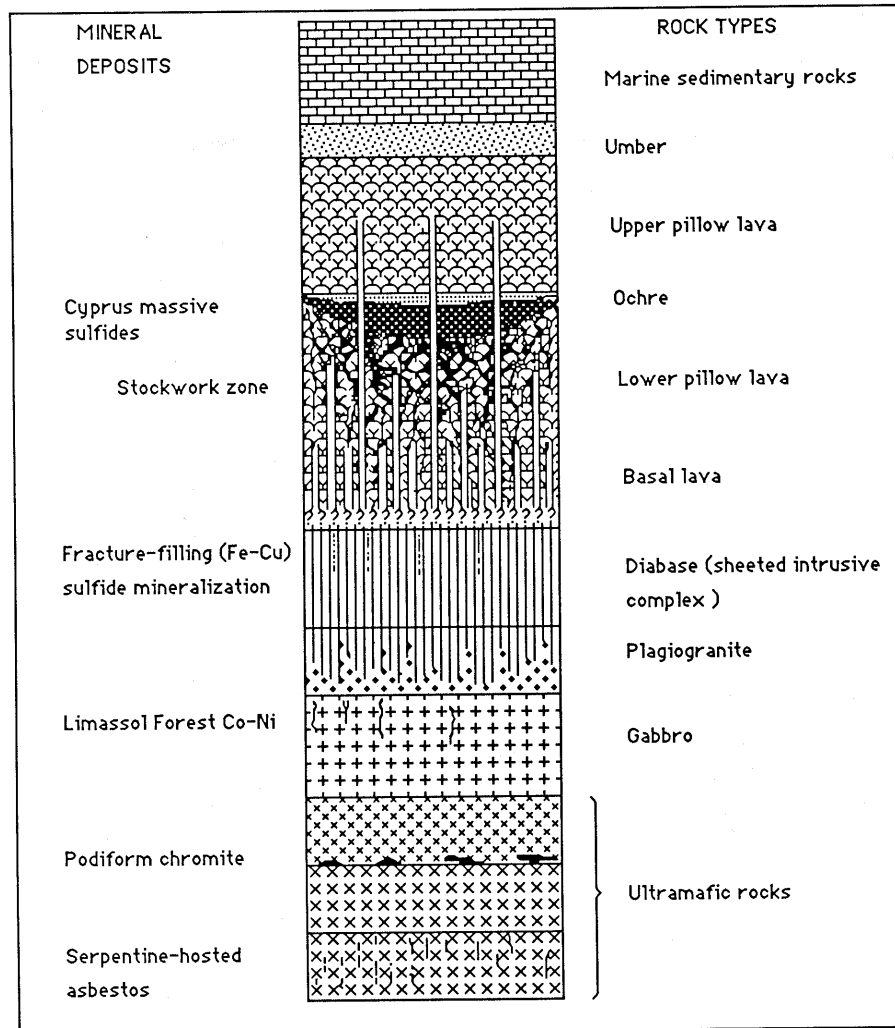


Figure 95. Generalized stratigraphic column through the Troodos ophiolite showing Cyprus massive sulfides and other deposit types and their associated rock types. Modified from Constantinou(1980).

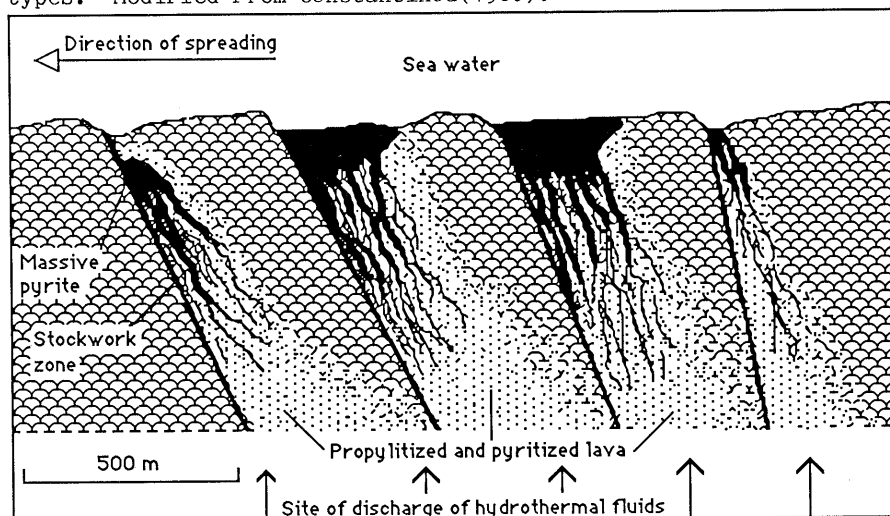


Figure 96. Cross section through the Kalavos district, Cyprus, showing relationship of massive sulfide deposits to faults and alteration zones. Section is drawn normal to the spreading axis and represents a time period prior to deposition of a thick sequence of pillow lavas and sedimentary rocks. Modified from Adamides (1980).

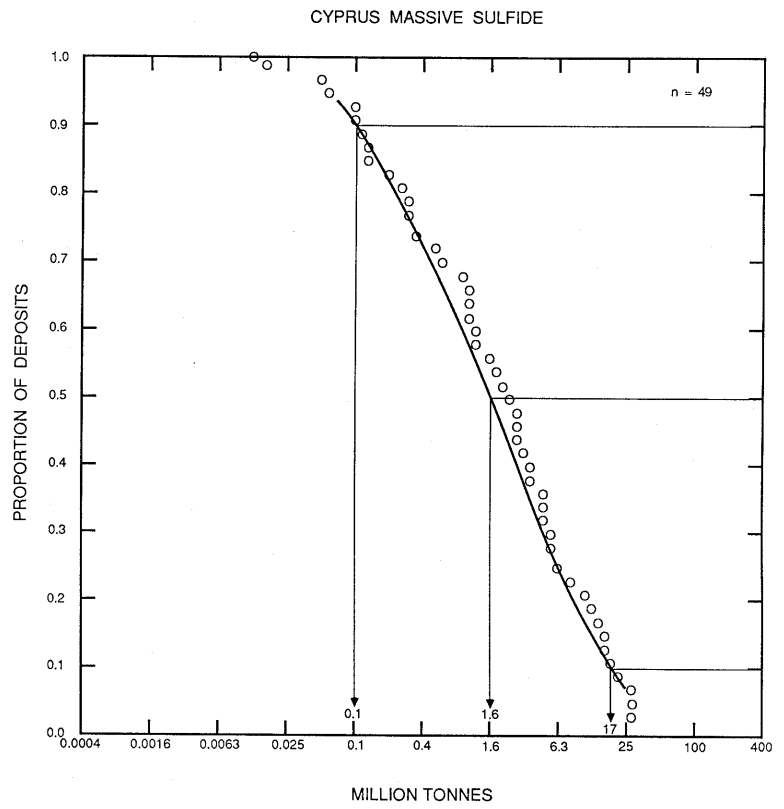


Figure 97. Tonnes of Cyprus massive sulfide deposits.

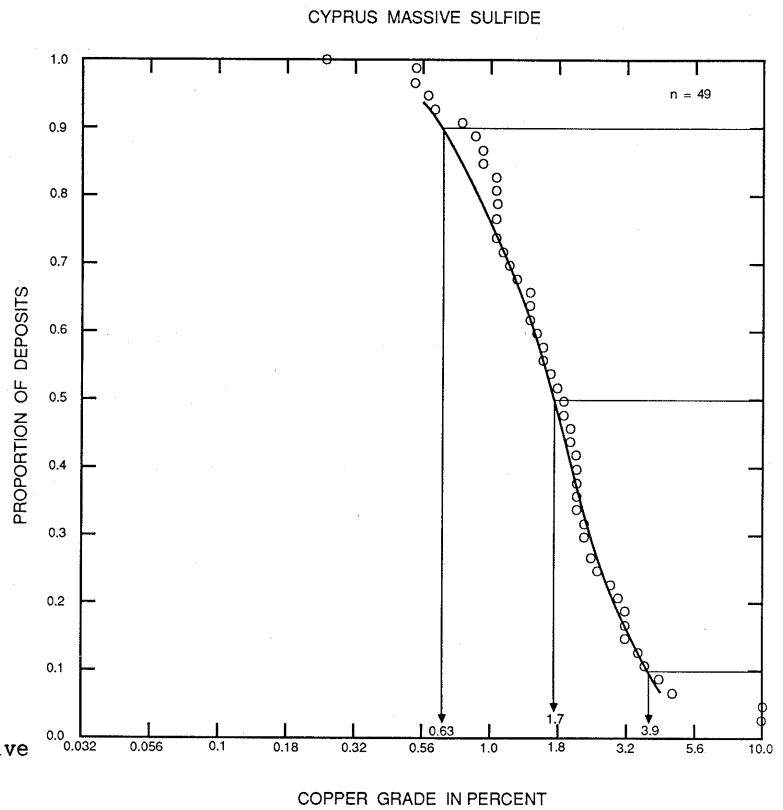


Figure 98. Copper grades of Cyprus massive sulfide deposits.

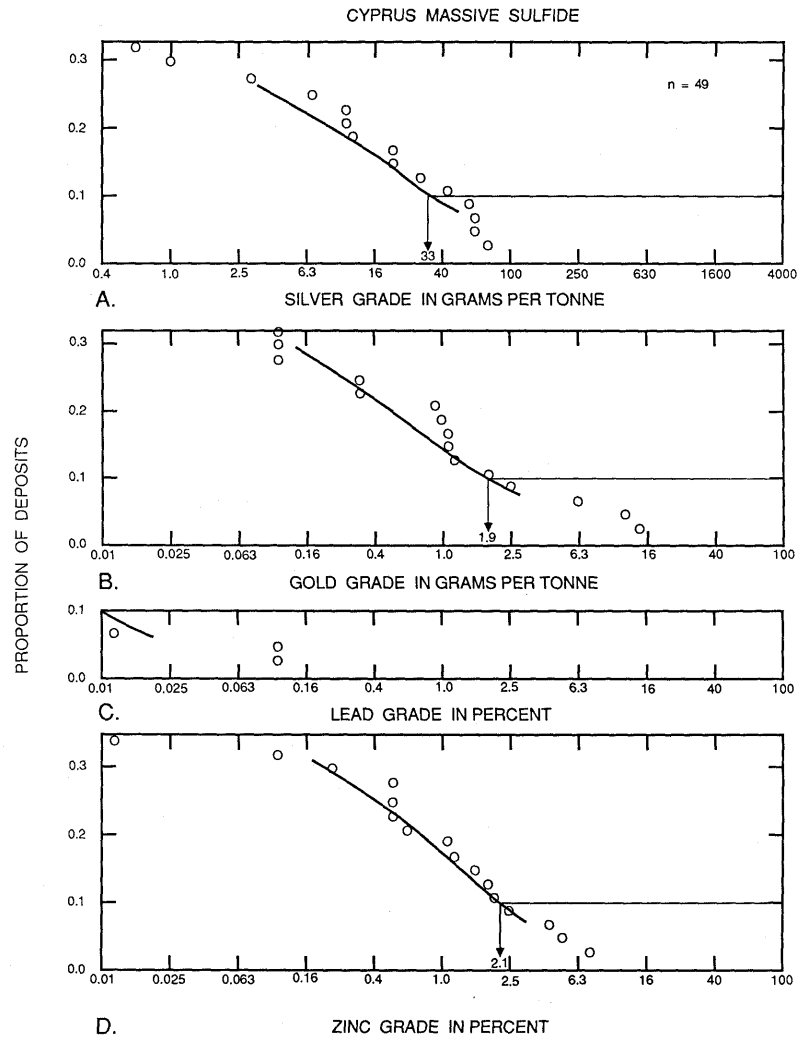


Figure 99. By-product grades of Cyprus massive sulfide deposits. A, Silver. B, Gold. C, Lead. D, Zinc.