

DESCRIPTIVE MODEL OF SEDIMENT-HOSTED Cu

By Dennis P. Cox

APPROXIMATE SYNONYM Sandstone Cu, includes Cu-shale (Lindsey, 1982).

DESCRIPTION Stratabound, disseminated copper sulfides in reduced beds of red-bed sequences.

GENERAL REFERENCES Tourtelot and Vine (1976), Gustafson and Williams (1981).

GEOLOGICAL ENVIRONMENT

Rock Types Red-bed sequence containing green or gray shale, siltstone, and sandstone. Thinly laminated carbonate and evaporite beds. Local channel conglomerate. Some deposits in thinly laminated silty dolomite.

Textures Algal mat structures, mudcracks, crossbedding and scour-and-fill structures. Fossil wood in channels.

Age Range Middle Proterozoic and Permian and early Mesozoic. Other Phanerozoic ages possible.

Depositional Environment Epicontinental shallow-marine basin near paleo-equator. Sabkhas. High evaporation rate. Sediments highly permeable.

Tectonic Setting(s) Intracontinental rift or aulacogen--failed arm of triple junction of plate spreading. Passive continental margin. Major growth faults.

Associated Deposit Types Halite, sylvite, gypsum, anhydrite. Sandstone uranium, basalt copper, and Kipushi Cu-Pb-Zn.

DEPOSIT DESCRIPTION

Mineralogy Chalcocite and other Cu_2S minerals + pyrite ± bornite ± native silver. Cu_2S replacement of early fine-grained pyrite is common. Deposits may be zoned with centers of chalcocite ± bornite, rims of chalcopyrite, and peripheral galena + sphalerite. Some deposits contain carrollite and Co-pyrite and Ge minerals.

Texture/Structure Fine disseminated, stratabound, locally stratiform. Framboidal or colloform pyrite. Cu minerals replace pyrite and cluster around carbonaceous clots or fragments.

Alteration Green, white, or gray (reduced) color in red beds. Regionally metamorphosed red beds may have purple color.

Ore Controls Reducing low-pH environment such as fossil wood, algal mat. Abundant biogenic sulfur. Pyritic sediments. Petroleum in paleoaquifers. High permeability of footwall sediments is critical. Boundaries between oxidized and reduced sediments.

Weathering Surface exposures may be completely leached. Secondary chalcocite enrichment down dip is common.

Geochemical Signature Cu, Ag, Pb, Zn (Mo, V, U) (CO, Ge). Au is low. Weak radioactivity in some deposits.

EXAMPLES

Kupferschiefer, GRMY	(Wedepohl, 1971)
White Pine, USMI	(Brown, 1971)
Western Montana (Belt), USMT	(Harrison 1972, 1982)
Kamoto, ZIRE	(Bartholomew and others, 1976)

GRADE AND TONNAGE MODEL OF SEDIMENT-HOSTED Cu

By Dan L. Mosier, Donald A. Singer, and Dennis P. Cox

COMMENTS Tonnages are probably underestimated for deposits in Zambia and Zaire due to poor reporting. The extent to which mineralization exists between mines in Zambia and Zaire is not considered. Estimates for the deposits in Russia probably represent districts. See figs. 154-156

DEPOSITS

<u>Name</u>	<u>Country</u>	<u>Name</u>	<u>Country</u>
Alaska	ZIMB	Mangum	USOK
Baluba	ZMBA	Mansfeld	GRMY
Big Horn (Yarrow Ck)	CNAL	Matchless	NAMB
Burra	AUSA	Matchless West	NAMB
Bwana Mkubwa	ZMBA	Mokambo	ZMBA
Cattle Grid	AUSA	Mt. Gunson	AUSA
Chacarilla	BLVA	Mt. Oxide	AUQL
Chambiashi	ZMBA	Mufulira	ZMBA
Chibuluma	ZMBA	Musoshi	ZIRE
Chibuluma West	ZMBA	Musonoi	ZIRE
Chingola-Nchanga	ZMBA	Nacimientto	USNM
Chongwe	ZMBA	Norah	ZIMB
Corocoro	BLVA	Oamite	NAMB
Creta	USOK	Pintada-Stauber	USNM
Crowell Area	USTX	Presque Isle	USMI
Dikulume-Mashamba	ZIRE	Roan Antelope	
Dzhezhkazgan		(Luanshya)	ZMBA
(Magakyan)	URRS	Rokana (Nkana)	ZMBA
Gwai River	ZIMB	Ruwe (Mutoshi)	ZIRE
Kalengwa	ZMBA	Shackleton	ZIMB
Kalushi (Kalulushi)	ZMBA	Silverside	ZIMB
Kamoto	ZIRE	Snowstorm	USMT
Kanmantoo	AUSA	Spar Lake (Troy)	USMT
Kansanshi	ZMBA	Tenke-Fungurume	ZIRE
Kapunda	AUSA	Tshinsenda	
Kilembe	UGND	(Kinsenda)	ZIRE
Konkola (Bancroft)	ZMBA	Udokan	URRS
Lena	URRS	White Pine	USMI
Lubin (Legnica- Glogow)	PLND		
Lumwana	ZMBA		
Mammoth (Gunpowder)	AUQL		
Mangula (Miriam)	ZIMB		

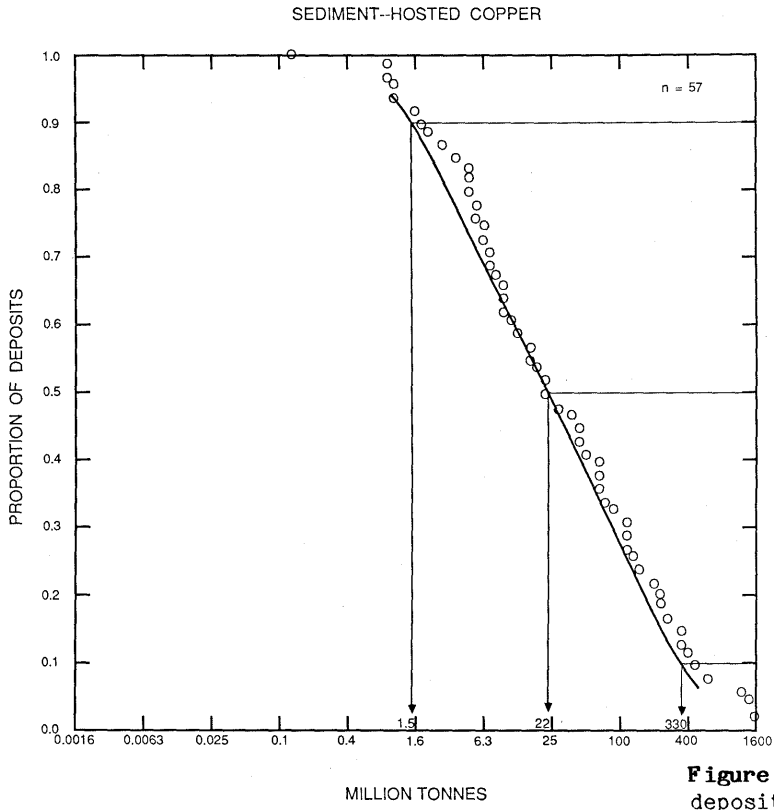


Figure 154. Tonnages of sediment-hosted Cu deposits.

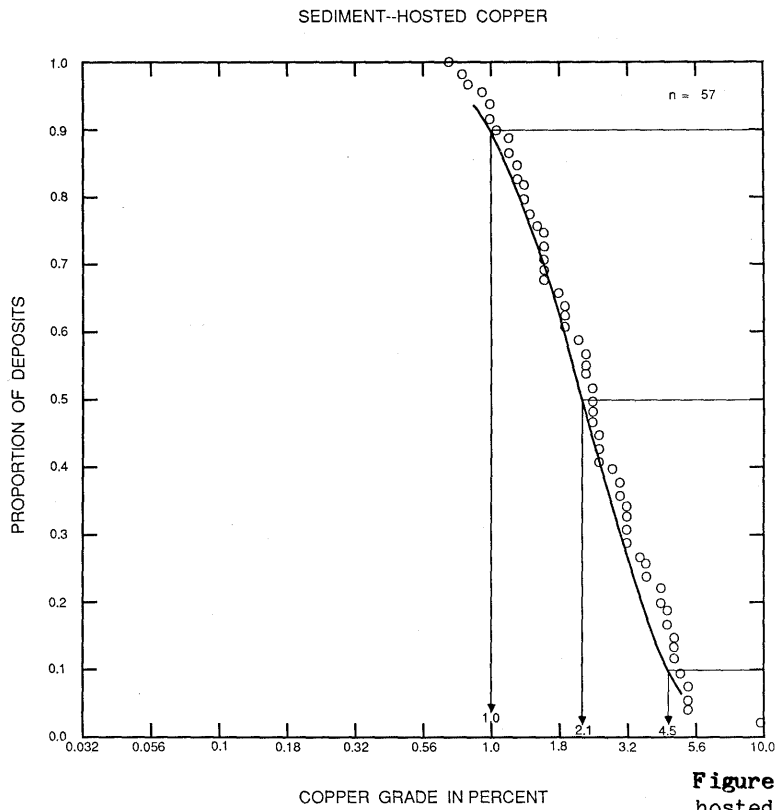


Figure 155. Copper grades of sediment-hosted Cu deposits.

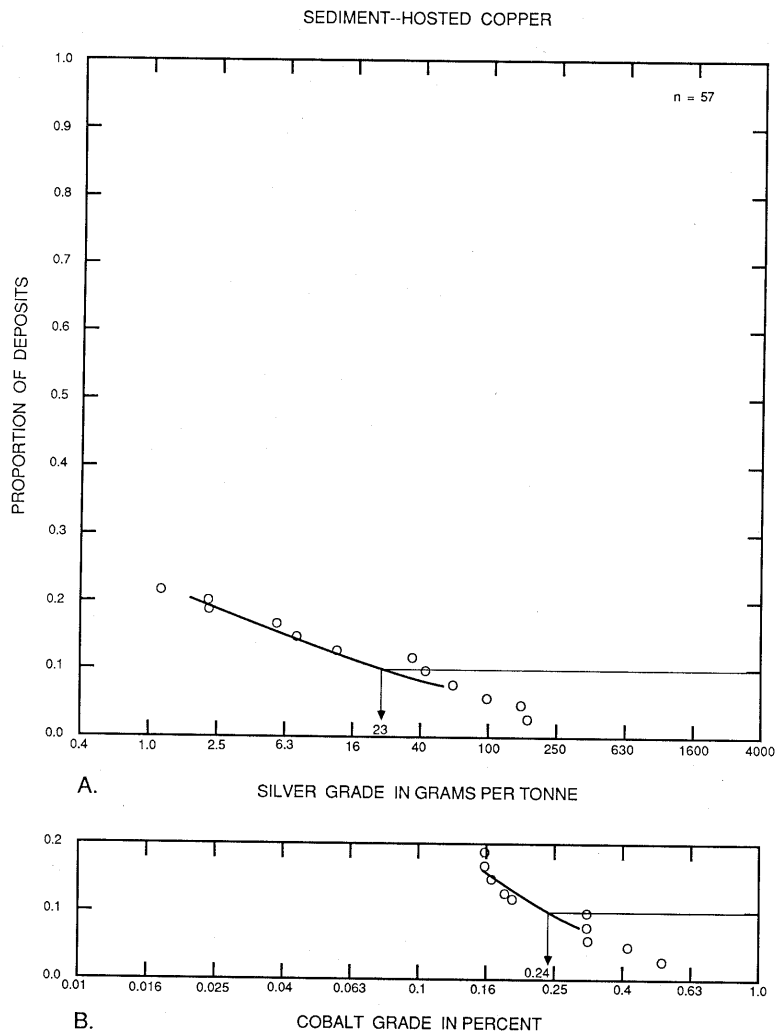


Figure 156. By-product grades of sediment-hosted Cu deposits. A, silver. B, Cobalt.