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SHORTER COMMUNICATIONS

PINCHITE, A NEW MERCURY OXYCHLORIDE FROM TERLINGUA, TEXAS

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INTRODUCTION

The mercury deposits near Terlingua, Brewster County, Texas, have been a long-standing source of interesting mineral specimens. In 1973 a small specimen from Terlingua was submitted to us by Mr. William W. Pinch of Rochester, New York, who had possessed the specimen for several years. Mr. Pinch, an experienced private collector, directed our attention to minute crystals which he believed to be a new mineral species, an opinion which our study readily confirmed. In recognition of Mr. Pinch's observations and his generous contributions to many of the major mineralogical museums of the world, we have named the mineral pinchite. The mineral and name have been approved by the Commission on New Minerals and Mineral Names of the I.M.A. Type specimens (milligrams) are preserved in the Royal Ontario Museum (No. M33258), in the private collection of Mr. Pinch, and in the Smithsonian Institution, Washington, D.C.

GENERAL APPEARANCE AND PHYSICAL PROPERTIES

Pinchite occurs as euhedral crystals up to 1 mm in size. Two habits have been observed and are depicted in Figure 1. The forms present are: {001}, {010}, {100}, and {012}.

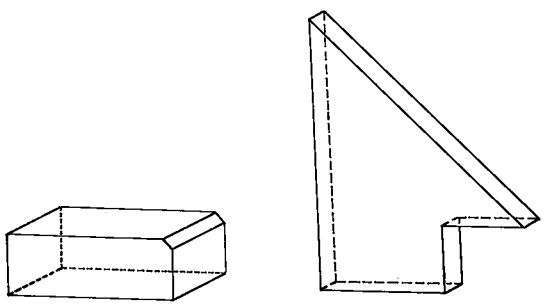

FIG. 1. Pinchite crystals showing (a) the more common habit and (b) the less common type.

The mineral is black to dark brown and has a reddish brown streak. It is quite soft. No cleavage was observed.

Thin fragments of the mineral are transparent and show strong pleochroism from red to almost opaque black. No optical constants could be measured. The refractive indices are higher than 2.00 and the birefringence is very strong.

Pinchite is associated with montroydite (HgO) and terlinguaite (Hg_2OCl).

X-RAY AND CHEMICAL DATA

The first clue as to the identity of pinchite was the agreement of its single crystal data with those determined by Weiss *et al.* (1954) for synthetic $HgCl_2 \cdot 4HgO$. The data for pinchite determined by the aprecession and Weissenberg methods in this study are: space group *Ibam*, $a = 11.6$, $b = 6.07$, and $c = 11.7$ Å. The data of Weiss *et al.* (1954) for synthetic $HgCl_2 \cdot 4HgO$ are: space group *Ibam*, $a = 11.5_0$, $b = 6.0_2$ and $c = 11.7_5$Å

A small amount of the synthetic $HgCl_2 \cdot 4HgO$ studied by Weiss *et al.* (1954) was kindly furnished to the writers by Dr. Gunter Nagorsen of the University of Munich. The *x*-ray powder diffraction data obtained for this material and for pinchite are presented in Table 1. The cell parameters of pinchite, refined from the *x*-ray powder data using the programme of Evans *et al.* (1963), are: $a = 11.54$, $b = 6.08$, and $c = 11.64$ Å.

An *x*-ray fluorescence scan of a few small crystals of pinchite detected only mercury. Through the kindness of Dr. R. G. V. Hancock, Department of Chemical Engineering, University of Toronto, a neutron activation analysis of pinchite was performed using synthetic pinchite and $HgCl_2$ as standards. The formula derived from the analysis (Table 2) agrees well with

TABLE 1. X-RAY POWDER DIFFRACTION DATA FOR SYNTHETIC $HgCl_2 \cdot 4HgO$ AND PINCHITE (Camera diameter 114.6 mm, CuKα rad.)

synthetic $HgCl_2 \cdot 4HgO$		pinchite (ROM no. M33258)			
I	$d_{obs.}$	I	$d_{obs.}$	$d_{calc.}$	hkl
10	5.85	10	5.82	5.82	002
60	3.95	60	3.94	3.94	211
40	3.261	35	3.256	3.251	310
50	2.926	50	2.919	2.910	004
100	2.843	100	2.837	2.846	213
				2.838	312
80	2.694	80	2.695	2.696	022
5	2.595	5	2.597	2.598	204
3	2.547	2	2.549	2.543	411
20	2.176	20	2.169	2.168	314
5	2.098	5	2.094	2.093	420
10	2.053	10	2.044	2.049	404
10	1.974	10	1.968	1.969	422
15	1.929	12	1.923	1.923	600
				1.825	125
10	1.825	10	1.822	1.825	116
				1.817	521
15	1.796	15	1.791	1.793	330
10	1.712	10	1.707	1.714	332
12	1.673	12	1.668	1.666	325
				1.666	316
15	1.641	15	1.636	1.636	026
10	1.610	10	1.610	1.610	406
15	1.570	15	1.568	1.566	622
10	1.527	15	1.524	1.525	433
				1.523	530
5	1.426	5	1.422	1.423	426
10	1.349	7	1.348	1.348	044
5	1.250	5	1.249	1.249	732
5	1.232	5	1.231	1.232	725
				1.230	716
15	1.137	15	1.135	1.137	352
				1.137	329

the theoretical formula of $Hg_5O_4Cl_2$. With $Z = 4$, the calculated density is 9.25 g/cm³ (natural) and 9.37 g/cm³ (synthetic). Weiss *et al.* (1954) obtained a density of 9.01 g/cm³ by pycnometer. In the present study, ten small crystals measured with the Berman balance gave a density of 9.5 g/cm³.

TABLE 2. CHEMICAL ANALYSIS OF PINCHITE

	theoretical wt % for $HgCl_2 \cdot 4HgO$	pinchite	molecular proportions	atoms in unit cell
HgO	95.18	94.5	0.4363	Hg 20.00
Cl	6.23	6.3	0.1777	Cl 8.15
Br	---	0.2	0.0025	Br 0.11
	101.41	101.0		O 15.99
less O≡(Cl+Br)	1.41	1.4	0.0875	
total	100.00	99.6		

Formula: $Hg_{20.00}O_{15.99}Cl_{8.15}Br_{0.11}$ or $4[Hg_{5.00}O_{4.00}Cl_{2.04}Br_{0.03}]$

Acknowledgements

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References

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