Mitridatite $Ca_2Fe_3^{3+}O_2(PO_4)_3 \cdot 3H_2O$

Crystal Data: Monoclinic. *Point Group: m.* Rarely as thin tabular pseudorhombohedral crystals, to 2 mm, comprised of {100}, {001}, {$\bar{4}$23}; more commonly massive, as nodules, veins, and crusts.

Physical Properties: *Cleavage:* Good on {100}. *Tenacity:* Typically pulverulent, friable, gumlike. Hardness = 2.5 if compact. D(meas.) = 3.24(2) D(calc.) = 3.249

Optical Properties: Translucent to opaque. *Color:* Olive-green, greenish yellow, brownish green, brownish black, red, bronzy-red. *Streak:* Olive-green. *Luster:* Dull, earthy to resinous. *Optical Class:* Biaxial (–). *Pleochroism:* Strong; X = pale greenish yellow; $Y = Z$ = deep greenish brown, red. *Absorption:* $Y = Z > X$. α = 1.762–1.785 β = n.d. γ = 1.770–1.85 2V(meas.) = 5°–10°

Cell Data: *Space Group: Aa.* a = 17.553(2) b = 19.354(3) c = 11.248(2) β = 95.84(1)° Z = 12

X-ray Powder Pattern: White Elephant mine, South Dakota, USA.
8.64 (10), 2.721 (7), 5.55 (6), 3.20 (4), 2.881 (4), 2.562 (4), 2.169 (4)

Chemistry:

	(1)	(2)		(1)	(2)
P_2O_5	31.5	34.41	CaO	17.4	18.13
Fe_2O_3	35.6	38.72	H_2O	12.8	8.74
Mn_2O_3	2.7		Total	100.0	100.00

(1) White Elephant mine, South Dakota, USA. (2) $Ca_2Fe_3O_2(PO_4)_3 \cdot 3H_2O$.

Occurrence: A common stain or crust on minerals near oxidizing ferrous phosphate minerals, typically triphylite or vivianite in granite pegmatite; a component of cement or fossil replacements in some ferruginous oölitic sediments; in phosphatic soils.

Association: Triphylite, vivianite, rockbridgeite, heterosite, huréaulite, fairfieldite, cyrilovite, jahnsite, collinsite, apatite, iron hydroxides.

Distribution: Probably more widespread than the literature suggests. Well-studied material occurs at: the Kamysh-Burun iron deposit and numerous other localities near Kerch, Crimean Peninsula, Ukraine. On the Taman Peninsula, and at the Voron'i massif, Kola Peninsula, Russia. In South Africa, in the Boons and West Driefontein Caves, Transvaal. In the USA, from the Tip Top, White Elephant, Bull Moose, and Linwood mines, near Custer, Custer Co., and the Gap Lode pegmatite, Pennington Co., South Dakota; in the Palermo #1 mine, near North Groton, Grafton Co., New Hampshire. At Glen Chosaidh, Loch Quoich, Inverness-shire, Scotland. In the Gunheath china clay pit, St. Austell, Cornwall, England. From Hagendorf, Bavaria, Germany. In the Mangualde pegmatite, near Mesquitela, and in the Bendada pegmatite, near Guarda, Portugal. At the Spring Creek mine, near Wilmington, South Australia. From the Rubicon and Tsaobismund pegmatites, south of Karibib, Namibia.

Name: For Mt. Mithridat [named for King Mithridates], within the city of Kerch, Ukraine, near which the first specimens were collected.

Type Material: A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 87594.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 955–956. (2) Moore, P.B. (1974) I. Jahnsite, segelerite, and robertsite, three new transition metal phosphate species. II. Redefinition of overite, an isotype of segelerite. III. (with J. Ito) Isotypy of robertsite, mitridatite, and arseniosiderite. Amer. Mineral., 59, 48–59. (3) Moore, P.B. and T. Araki (1977) Mitridatite: a remarkable octahedral sheet structure. Mineral. Mag., 41, 527–528 and M8–M9. (4) Moore, P.B. and T. Araki (1977) Mitridatite, $Ca_6(H_2O)_6[Fe_9^{III}O_6(PO_4)_9] \cdot 3H_2O$. A noteworthy octahedral sheet structure. Inorg. Chem., 16, 1096–1106.