Haggertyite $Ba[Ti_5Fe^{3+}_2Fe^{2+}_4Mg]O_{19}$

Crystal Data: Hexagonal. *Point Group*: 6/*m* 2/*m* 2/*m*. As thin platelets, occasionally with hexagonal outlines, to 100 μm.

Physical Properties: *Cleavage*: None. *Fracture*: Irregular to conchoidal. Hardness = 5 VHN = 460-540, 500 average (50 g load). D(meas.) = n.d. D(calc.) = 4.74

Optical Properties: Opaque. *Color*: Light gray in reflected light. *Streak*: n.d. *Luster*: Metallic. *Optical Class*: Anisotropic (weak). Very weakly bireflectant; brown rotation colors. *n*(calc.) = 2.30 R_1-R_2: (470) 17.3-16.9 $(5.37\text{-}5.13)_{oil}$, (546) 16.8-16.35 $(5.19\text{-}4.90)_{oil}$, (589) 16.9-16.3 $(5.29\text{-}4.92)_{oil}$, (650) 17.1-16.4 $(5.42\text{-}5.00)_{oil}$

Cell Data: *Space Group*: $P6_3/mmc$. a = 5 5.9369(1) c = 5 23.3445(6) Z = 2

X-ray Powder Pattern: Calculated pattern.
2.641 (100), 2.795 (90), 1.634 (47), 1.481 (47), 2.437 (46), 2.963 (44), 1.676 (36)

Chemistry:

	(1)	(2)		(1)	(2)
SiO_2		0.06	V_2O_3		0.21
TiO_2	39.1	38.72	Cr_2O_3	1.4	0.97
FeO	41.2	40.76	BaO	10.1	10.25
MgO	2.7	2.18	K_2O	1.42	1.37
MnO	0.80	1.27	Na_2O		0.24
NiO	0.25	0.10	Total	96.97	96.18
ZnO		0.05			

(1) Crater of Diamonds State Park, Pike County, Arkansas, USA; average of 56 electron microprobe analyses, Fe^{2+}/Fe^{3+} calculated for charge balance; corresponds to $Ba_{0.68}K_{0.31}Ti_{5.05}Fe^{2+}_{3.91}Fe^{3+}_{2.01}Mg_{0.69}(Cr,Mn,Ni)_{0.34}O_{19}$. (2) Walgidee Hills, West Kimberley region, Western Australia; average of 12 electron microprobe analyses, Fe^{2+}/Fe^{3+} calculated for charge balance; corresponds to $(Ba_{0.7}K_{0.3})_{\Sigma=1.0}(Ti_{5.0}Fe^{3+}_{2.1}Cr_{0.1}Fe^{2+}_{3.8}Mn_{0.2}Mg_{0.6}Na_{0.1})_{\Sigma=12}O_{19}$.

Mineral Group: Magnetoplumbite group.

Occurrence: As isolated crystals or in small groups within the reaction rims around serpentinized mafic xenoliths in olivine lamproite (Arkansas); in the groundmass of diamondiferous olivine lamproite pipes (Australia).

Association: Ti-K richterite, diopside, chrome-spinel, olivine (altered), ilmenite, jeppeite, priderite (Arkansas); Ti-phlogopite, diopside, Ti-K-richterite, olivine, leucite, priderite (Walgidee Hills).

Distribution: From the Prairie Creek lamproite, Crater of Diamonds State Park, near Murfreesboro, Pike County, Arkansas, USA. From the Walgidee Hills and the Ellendale 9 pipe, West Kimberley region, Western Australia.

Name: Honors Stephen E. *Haggerty* (b. 1938), Department of Geology, University of Massachusetts, USA, for his contributions to the understanding of the mineralogy and crystal chemistry of titanate minerals from the Earth's mantle.

Type Material: The Natural History Museum, London, England (BM 1997,14); the University of Massachusetts, Department of Geology (Amherst), and the Smithsonian Institution, Washington, D.C., USA.

References: (1) Grey, I.E., D. Velde, and A.J. Criddle (1998) Haggertyite, a new magnetoplumbite-type titanate mineral from the Prairie Creek (Arkansas) lamproite. Amer. Mineral., 83, 1323-1329. (2) Jaques, A.L., F. Brink , and J. Chen (2020) Magmatic haggertyite in olivine lamproites of the West Kimberley region, Western Australia. Amer. Mineral., 105, 1724-1733. (3) Holtstam D. and U. Hålenius (2020) Nomenclature of the magnetoplumbite group. Mineral. Mag., 84, 376-380.