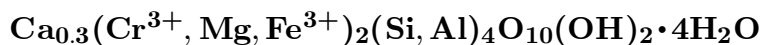


Volkonskoite

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Crystal Data: Monoclinic, presumably. *Point Group:* n.d. Fine scaly to fibrous; massive.**Physical Properties:** *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 1–2
D(meas.) = 2.11–2.36 D(calc.) = n.d. Positive identification of minerals in the smectite group may need data from DTA curves, dehydration curves, and X-ray powder patterns before and after treatment by heating and with organic liquids.**Optical Properties:** Translucent. *Color:* Bright to dark green, emerald-green; in transmitted light, emerald-green. *Luster:* Dull.*Optical Class:* Biaxial (-). $\alpha = 1.551$ – 1.560 $\beta = 1.569$ $\gamma = 1.564$ $2V(\text{meas.}) = \text{Small}$.**Cell Data:** *Space Group:* n.d. $Z = \text{n.d.}$ **X-ray Powder Pattern:** n.d.

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SiO ₂	37.70	41.5	40.4	CaO	2.45	1.39	2.56
TiO ₂	0.06	0.07	0.05	Na ₂ O		< 0.15	< 0.15
Al ₂ O ₃	4.93	5.16	4.13	K ₂ O	0.10	0.15	0.21
Fe ₂ O ₃	4.89	4.52	5.16	H ₂ O ⁺	20.19	16.83	16.75
Cr ₂ O ₃	23.50	20.4	23.5	CO ₂		1.94	2.60
FeO		0.40	0.1	P ₂ O ₅		0.07	< 0.05
MnO	0.36	0.07	0.05	Total	100.97	[99.57]	101.46
MgO	6.79	7.07	5.95				

(1) Okhansk region, Russia. (2) Mt. Efimyatskaya, Russia; by XRF and TGA, Fe²⁺:Fe³⁺ by Mössbauer spectroscopy, original total given as 99.73% with additional “carbonate carbon;” corresponds to $(\text{Ca}_{0.11}\text{Mg}_{0.11}\text{Fe}_{0.03}^{2+}\text{K}_{0.02})_{\Sigma=0.27}(\text{Cr}_{1.18}\text{Mg}_{0.78}\text{Fe}_{0.29}^{3+}\text{Ca}_{0.02})_{\Sigma=2.27}(\text{Si}_{3.50}\text{Al}_{0.51})_{\Sigma=4.01}\text{O}_{10}(\text{OH})_2 \cdot 3.64\text{H}_2\text{O}$. (3) Okhansk region, Russia; do.; corresponds to $(\text{Ca}_{0.25}\text{Mg}_{0.05}\text{K}_{0.03}\text{Fe}_{0.01}^{2+}\text{Mn}_{0.01})_{\Sigma=0.35}(\text{Cr}_{1.07}\text{Mg}_{0.75}\text{Fe}_{0.35}^{3+})_{\Sigma=2.17}(\text{Si}_{3.59}\text{Al}_{0.43})_{\Sigma=4.02}\text{O}_{10}(\text{OH})_2 \cdot 4.22\text{H}_2\text{O}$.

Mineral Group: Smectite group.**Occurrence:** An epigenetic mineral in sandstones, conglomerates, and red beds, commonly filling voids from the decomposition of organic matter (Okhansk region, Russia); a weathering product of serpentinite (Gotse Delchev, Bulgaria).**Association:** Chlorite, tridymite.**Distribution:** On Mt. Efimyatskaya and elsewhere in the Okhansk region, middle Kama River area, Perm basin, Ural Mountains, Russia. In the Belgorod-Dnestrovskii (Akkerman) area, Ukraine. In Bulgaria, near Gotse Delchev (Nevrokop), Pirin Mountains.**Name:** For Prince Petr Mikhailovich Volkonskii (1776–1852), Minister of the Imperial Court, Russia, patron of the natural sciences.**Type Material:** National Museum of Natural History, Washington, D.C., USA, R4820, 16308.

References: (1) Dana, E.S. (1892) Dana’s system of mineralogy, (6th edition), 696–697.
 (2) Khoury, H.N., R.C. Mackenzie, J.D. Russell, and J.M. Tait (1984) An iron-free volkonskoite. *Clay Minerals*, 19, 43–57. (3) Foord, E.E., H.C. Starkey, J.E. Taggart, Jr., and D.R. Shawe (1987) Reassessment of the volkonskoite-chromium smectite nomenclature problem. *Clays and Clay Minerals*, 35, 139–149.

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