Volkonskoite  \( \text{Ca}_{0.3}(\text{Cr}^{3+}, \text{Mg}, \text{Fe}^{3+})\text{2(Si, Al)}\text{4O}_{10}(\text{OH})\text{2} \cdot 4\text{H}_2\text{O} \)

Crystal Data:  Monoclinic, presumably.  Point Group: n.d.  Fine scaly to fibrous; massive.

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 (−).  \( \alpha = 1.551–1.560 \quad \beta = 1.569 \quad \gamma = 1.564 \quad 2V(\text{meas.}) = \text{Small} \).

Cell Data:  Space Group: n.d.  \( Z = \text{n.d.} \).

X-ray Powder Pattern:  n.d.

Chemistry:

\[
\begin{array}{cccccc}
\text{SiO}_2 & 37.70 & 41.5 & 40.4 & \text{CaO} & 2.45 & 1.39 & 2.56 \\
\text{TiO}_2 & 0.06 & 0.07 & 0.05 & \text{Na}_2\text{O} & <0.15 & <0.15 & <0.15 \\
\text{Al}_2\text{O}_3 & 4.93 & 5.16 & 4.13 & \text{K}_2\text{O} & 0.10 & 0.15 & 0.21 \\
\text{Fe}_2\text{O}_3 & 4.89 & 4.52 & 5.16 & \text{H}_2\text{O}^+ & 20.19 & 16.83 & 16.75 \\
\text{Cr}_2\text{O}_3 & 23.50 & 20.4 & 23.5 & \text{CO}_2 & 1.94 & 2.60 & \\
\text{FeO} & 0.40 & 0.40 & 0.1 & \text{P}_2\text{O}_5 & 0.07 & <0.05 & \\
\text{MnO} & 0.36 & 0.07 & 0.05 & & & & \\
\text{MgO} & 6.79 & 7.07 & 5.95 & & & & \\
\end{array}
\]

(1) Okhansk region, Russia. (2) Mt. Efmyatskaya, Russia; by XRF and TGA, \( \text{Fe}^{2+}:\text{Fe}^{3+} \) by Mössbauer spectroscopy, original total given as 99.73% with additional “carbonate carbon;” corresponds to \( (\text{Ca}_{0.11}\text{Mg}_{0.07}\text{K}_{0.02})\Sigma=0.27(\text{Cr}_{1.18}\text{Mg}_{0.78}\text{Fe}^{3+}_{0.29}\text{Ca}_{0.02})\Sigma=2.27(\text{Si}_{3.58}\text{Al}_{0.51})\Sigma=4.01\text{O}^\text{10(OH)}^\text{2} \cdot 3.64\text{H}_2\text{O} \). (3) Okhansk region, Russia; do.; corresponds to \( (\text{Ca}_{0.25}\text{Mg}_{0.01}\text{K}_{0.03}\text{Fe}^{2+}_{0.01}\text{Mn}_{0.01})\Sigma=0.35(\text{Cr}_{1.07}\text{Mg}_{0.75}\text{Fe}^{3+}_{0.35})\Sigma=2.17(\text{Si}_{3.59}\text{Al}_{0.43})\Sigma=4.02\text{O}^\text{10(OH)}^\text{2} \cdot 4.22\text{H}_2\text{O} \).

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 serpentine (Gotse Delchev, Bulgaria).

Association:  Chlorite, tridymite.

Distribution:  On Mt. Efmyatskaya 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.


References:


All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of Mineral Data Publishing.