Taranakite \((\text{K, Na})_3(\text{Al, Fe}^{3+})_5(\text{PO}_4)_2(\text{PO}_3\text{OH})_6 \cdot 18\text{H}_2\text{O}\)

(C)2001-2005 Mineral Data Publishing, version 1

Crystal Data: Hexagonal. Point Group: \( \overline{3} 2/m \). Pseudohexagonal platy crystals, rarely to 0.5 mm; typically in compact nodular aggregates, pulverulent, powdery, flourlike to claylike, massive.

Physical Properties: Tenacity: Unctuous. Hardness = Very soft. \( \text{D(meas.)} = 2.12-2.15 \) \( \text{D(calc.)} = 2.12 \)


Optical Class: Uniaxial (–). \( \omega = 1.506-1.510 \) \( \epsilon = 1.500-1.503 \)

Cell Data: Space Group: \( \overline{R} \overline{3c} \) (synthetic). \( a = 8.7025(11) \) \( c = 95.05(1) \) \( Z = 6 \)

X-ray Powder Pattern: Apulian Cave PU 38, Italy.
15.82 (100), 3.82 (40), 3.14 (31), 3.36 (29), 7.47 (28), 3.59 (22), 7.92 (18)

Chemistry: \[
\begin{array}{cccccc}
\text{P}_2\text{O}_5 & 42.32 & 41.88 & 42.30 & \text{K}_2\text{O} & 7.09 \\
\text{Al}_2\text{O}_3 & 19.03 & 17.48 & 18.99 & \text{H}_2\text{O} & 31.10 \\
\text{Fe}_2\text{O}_3 & 0.42 & 1.67 & & \text{insol.} & \\
\text{Na}_2\text{O} & & & & 0.37 &
\end{array}
\]

(1) Onino-Iwaya Cave, Japan; by gravimetry and flame photometry; corresponds to \( \text{H}_7\text{O}_{9.97}(\text{Al, Fe})_{4.98}(\text{PO}_4)_{8.19.7}\text{H}_2\text{O} \).
(2) Castellana Cave, Italy. \( \text{K}_3\text{Al}_5(\text{PO}_4)_{2}(\text{PO}_3\text{OH})_6 \cdot 18\text{H}_2\text{O} \).

Occurrence: Formed from phosphatic solutions derived from bird or bat guano reacting with clays or aluminous rocks under perenially damp conditions; the most common phosphate mineral in caves.

Association: Vashegyite, leucophosphite, minyulite, francoanellite, brushite, ardealite, strengite, variscite, vivianite.

Distribution: From the Sugarloaves, near New Plymouth, Taranaki Peninsula, New Zealand. On Réunion Island, Indian Ocean; Island Leones, Patagonia, Argentina; King George Island, Maritime Antarctic. In Australia, in the Russenden Cave, Queensland; the Skipton lava tube caves, 40 km southwest of Ballarat, Victoria; in caves at Minegarra, Western Australia; and the Jenolan Caves, New South Wales. In the Yangsue Posayen Cave, 20 km south of Guilin, Guangxi Province, China. From the Niah Great Cave, Sarawak, Malaysia. In the Onino-Iwaya Cave, Hiroshima Prefecture, Japan. From the Tour Combes Cave, near Oran, Algeria. In Etienne’s Cave, and well-crystallized in Christmas Cave, Transvaal, South Africa. From the Bacho Kvo Cave, Bulgaria. In the Minerva Grotto, Fauzan, Hérault, France. In Italy, in the Castellana Cave, south of Bari, Puglia; on Monte Alburno, near Controne, Salerno. In the USA, in the Pig Hole Cave, Giles Co., Virginia; and the Low Water Bridge Cave, Greene Co., Missouri. Additional localities are known.

Name: For its first recognized occurrence on the Taranaki Peninsula, New Zealand.


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.