

Takanelite

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Crystal Data: Hexagonal. *Point Group:* n.d. Intergrown on a fine scale with other minerals, colloform, banded, nodular massive.

Physical Properties: *Tenacity:* Friable. Hardness = 2.5–3 VHN = 480 (100 g load). D(meas.) = 3.43 D(calc.) = 3.436

Optical Properties: Opaque. *Color:* Steel-gray to black; yellowish gray in reflected light. *Streak:* Brownish black to dark brown. *Luster:* Submetallic to dull. *Optical Class:* Uniaxial. *Pleochroism:* Weak; yellowish white to yellowish light gray. *Anisotropism:* Moderate; yellowish gray to light brownish gray. R₁–R₂: n.d.

Cell Data: *Space Group:* n.d. *a* = 2.830–2.843 *c* = 7.240–7.53 *Z* = 1

X-ray Powder Pattern: Nomura mine, Japan; close to ranciéite, variable with hydration. 7.57 (100), 3.765 (25), 2.349 (20), 4.43 (18b), 1.420 (17), 2.462 (15), 2.065 (10)

Chemistry:	(1)		(2)	
	(1)	(2)	(1)	(2)
SiO ₂	3.61		CaO	2.66
TiO ₂	trace		BaO	0.00
MnO ₂	70.39	74.01	Na ₂ O	0.05
Al ₂ O ₃	1.70		K ₂ O	0.05
Fe ₂ O ₃	1.34	0.26	H ₂ O ⁺	4.92
MnO	13.06	10.42	H ₂ O ⁻	2.22
MgO	0.22	0.59	H ₂ O	11.50
			<u>Total</u>	<u>100.22</u>
				100.75

(1) Nomura mine, Japan; after subtraction of impurity SiO₂, Al₂O₃, Fe₂O₃, H₂O⁻ and part of H₂O⁺ as halloysite, goethite, and quartz, corresponds to (Mn_{0.89}²⁺Ca_{0.23}Mg_{0.03})_{Σ=1.15}Mn_{3.94}⁴⁺O₉•1.3H₂O. (2) Janggun mine, South Korea; by electron microprobe, Mn and H₂O by wet methods; corresponds to (Mn_{0.68}²⁺Ca_{0.32}Mg_{0.09}K_{0.04})_{Σ=1.13}Mn_{3.96}⁴⁺O₉•2.97H₂O.

Polymorphism & Series: Forms a series with ranciéite.

Occurrence: Formed in the oxide zone of a bedded manganese deposit in metamorphosed cherts (Nomura mine, Japan); a secondary mineral derived from alteration of rhodochrosite in a manganese deposit (Janggun mine, South Korea).

Association: Braunitz, todorokite, halloysite, goethite, quartz (Nomura mine, Japan); nsutite, pyrolusite (Janggun mine, South Korea).

Distribution: In the Nomura mine, Ehime Prefecture, Japan. From the Janggun mine, Bonghwa district, South Korea. At the Anson Betts mine, Plainfield, Hampshire Co., Massachusetts, and from Marfa, Presidio Co., Texas, USA.

Name: To honor Dr. Katsutoshi Takane (1899–1945), Professor of Mineralogy, Tohoku University, Sendai, Japan.

Type Material: Tohoku University, Sendai, Japan.

References: (1) Nambu, M. and K. Tanida (1971) New mineral takanelite. J. Japan. Assoc. Mineral. Petrol. Econ. Geol., 65, 1–15 (in Japanese with English abs.). (2) (1971) Amer. Mineral., 56, 1487–1488 (abs. ref. 1). (3) Kim, S.J. (1991) New characterization of takanelite. Amer. Mineral., 76, 1426–1430. (4) Kim, S.J. (1993) Chemical and structural variations in ranciéite–takanelite solid solution series. Neues Jahrb. Mineral., Monatsh., 233–240. 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.