

**Crystal Data:** Tetragonal; typically metamict. *Point Group:* 4/*m*. As prismatic to acicular dipyrarnidal crystals, to 20 cm; granular, massive.

**Physical Properties:** *Cleavage:* {111}, poor. *Fracture:* Subconchoidal. *Tenacity:* Brittle. Hardness = 5.5–6.5 D(meas.) = 5.6–5.8 D(calc.) = [5.65]

**Optical Properties:** Opaque, transparent on thin edges. *Color:* Gray, yellow, brown, brownish black when altered; light brown to dark brown in transmitted light. *Streak:* Brown, yellow-brown, greenish gray. *Luster:* Dull; vitreous to submetallic on fractures. *Optical Class:* Isotropic; rarely uniaxial.  $n = 2.05\text{--}2.19$

**Cell Data:** *Space Group:*  $I4_1/a$ .  $a = 5.15$   $c = 10.89$   $Z = 4$

**X-ray Powder Pattern:** Madawaska, Canada; after heating at 1200 °C. 3.12 (100), 2.96 (90), 1.901 (50), 2.74 (40), 1.855 (30), 3.01 (20), 2.64 (20)

<b>Chemistry:</b>	(1)	(2)	(1)	(2)
WO <sub>3</sub>	0.15		Ce <sub>2</sub> O <sub>3</sub>	7.63
Nb <sub>2</sub> O <sub>5</sub>	44.45	54.07	Er <sub>2</sub> O <sub>3</sub>	9.81
Ta <sub>2</sub> O <sub>5</sub>	6.30		FeO	0.74
UO <sub>2</sub>	2.58		CaO	0.61
SnO <sub>2</sub>	0.47		H <sub>2</sub> O	1.49
Y <sub>2</sub> O <sub>3</sub>	24.87	45.93	<b>Total</b>	<b>99.10</b>
				<b>100.00</b>

(1) Near Cape Farewell, Greenland. (2) YNbO<sub>4</sub>.

**Polymorphism & Series:** Dimorphous with fergusonite-beta-(Y); forms a series with formanite-(Y).

**Occurrence:** Typical of rare-earth-bearing granite pegmatites; in placers.

**Association:** Monazite, gadolinite, thalenite, euxenite, allanite, zircon, biotite, magnetite.

**Distribution:** Widespread, but in small amounts. On Qeqertaussaq [Kikertaursuk] Island, Julienhåb district, Greenland. In Norway, many localities in the Evje-Iveland district; from Arendal; at Berg, near Råde; from Hundholmen; and from near Risør. In Sweden, at Ytterby, on Resarö Island, near Vaxholm, and Kårarfvet, near Falun. In Finland, from Laurinmäki. From the Blum mine, Ilmen Mountains, Southern Ural Mountains, Russia. In the Bayan Obo Fe–Nb–RE deposit, 130 km north of Baotou, Inner Mongolia, China. In Madagascar, from Ambatofotsikely, Ranomafana, Fiadanana, and elsewhere. In the USA, from the Baringer Hill pegmatite, 26 km west of Burnet, Llano Co., Texas; in the Champion and Rutherford pegmatite deposits, Amelia Co., and at Little Friar Mountain, Amherst Co., Virginia; at Spruce Pine, Mitchell Co., North Carolina; from Storeville, Anderson Co., South Carolina; at Rockport, Cape Ann, Essex Co., Massachusetts. At Madawaska, Ontario, Canada. From Hakatamura, Iyo Prefecture, and at Naegi, Mino Prefecture, Japan.

**Name:** Honors Robert Ferguson (1767–1840), landowner, politician, and mineral collector, of Raith, near Kirkaldy, Scotland, and for its predominant *yttrium* content.

**Type Material:** n.d.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 757–763. (2) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 729–730. (3) Vlasov, K.A., Ed. (1966) Mineralogy of rare elements, v. II, 430–438. (4) Berman, J. (1955) Identification of metamict minerals by X-ray diffraction. *Amer. Mineral.*, 40, 805–827. (5) Graham, J. and M.R. Thornber (1974) The crystal chemistry of complex niobium and tantalum oxides I. Structural classification of MO<sub>2</sub> phases. *Amer. Mineral.*, 59, 1026–1039. (6) Komkov, A.I. (1959) The structure of natural fergusonite, and of a polymorphic modification. *Kristallografiya (Sov. Phys. Crystal.)*, 4, 836–841 (in Russian).

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.