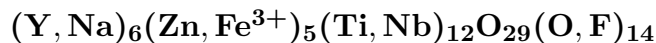


Murataite

©2001-2005 Mineral Data Publishing, version 1

Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$. As subhedral crystals, to 5 mm; granular.**Physical Properties:** *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 5–6.5
VHN = 782–870, 827 average (100 g load). D(meas.) = 4.50–4.69 D(calc.) = 4.64**Optical Properties:** Opaque to translucent on thin edges. *Color:* Black; brown or yellow in transmitted light; gray in reflected light, with faint orange internal reflections.*Luster:* Submetallic.*Optical Class:* Isotropic; slight anisotropism due to strain. $n = 2.11$ – 2.13 *Anisotropism:* Weak.*Birefractance:* Slight.

R: (546) 13.7–13.3, (589) 13.1–12.7, (630) 12.7–12.3

Cell Data: *Space Group:* $F\bar{4}3m$. $a = 14.886(2)$ $Z = 4$ **X-ray Powder Pattern:** St. Peters Dome, Colorado, USA.

2.858 (10), 1.746 (8), 1.489 (8), 2.468 (6), 1.432 (5), 1.138 (5), 8.51 (3)

Chemistry:	(1)	(2)	(3)		(1)	(2)	(3)
SiO ₂	0.64	0.34		Nb ₂ O ₅	10.01	10.10	0.0
TiO ₂	37.87	38.07	48.2	Fe ₂ O ₃		3.99	
SnO ₂	0.17	0.27		FeO	4.37		2.3
Y ₂ O ₃	12.06	12.53	20.5	MnO	0.61	0.75	
Gd ₂ O ₃	0.17	0.27		PbO	0.11		
Tb ₂ O ₃		[0.16]		ZnO	12.45	11.32	16.2
Dy ₂ O ₃	2.18	2.59		CaO	0.90	0.91	6.7
Ho ₂ O ₃	0.57	0.95		Na ₂ O	5.80	6.10	5.9
Er ₂ O ₃	3.09	2.83		F	6.55	7.11	0.0
Tm ₂ O ₃	0.34	0.45		H ₂ O	0.55	[0.55]	
Yb ₂ O ₃	2.96	3.11	0.7	–O = F ₂	2.76	2.99	
Lu ₂ O ₃	0.34	0.47		Total	[98.98]	[99.88]	100.5

(1) St. Peters Dome, Colorado, USA; by XRF, flame photometry, electron microprobe, semiquantitative spectrographic analysis, volumetric and microcoulometric methods; after rejection of Ba 0.008%. (2) Do.; by electron microprobe, total Fe as Fe₂O₃, Tb₂O₃ interpolated, H₂O from (1); corresponds to (Na_{3.97}Y_{2.24}RE_{1.15}Zn_{2.81}Fe_{1.01}³⁺Ca_{0.33}Mn_{0.21})_{Σ=11.72}(Ti_{9.60}Nb_{1.53}Si_{0.11}Sn_{0.04})_{Σ=11.28}O_{32.11}F_{7.55}(OH)_{1.23}. (3) Burpala massif, Russia.

Occurrence: A rare accessory mineral in samples from the dump of a pegmatite subjected to alkali metasomatism (St. Peters Dome, Colorado, USA); in pegmatite in a differentiated alkalic massif (Burpala massif, Russia).**Association:** Quartz, astrophyllite, microcline, albite, riebeckite, chlorite, zircon, aegirine, anatase, rutile, thorite, pyrochlore, xenotime, genthelvite, zincian davidite (St. Peters Dome, Colorado, USA); landauite, rutile, monazite, bastnäsite, brookite (Burpala massif, Russia).**Distribution:** From the St. Peters Dome area, near Pikes Peak, El Paso Co., Colorado, USA. In the Burpala massif, 120 km north of Lake Baikal, eastern Siberia.**Name:** To honor Kiguma Jack Murata (1909–), geochemist, U.S. Geological Survey, Menlo Park, California, USA, for his work on rare-earth chemistry.**Type Material:** National Museum of Natural History, Washington, D.C., USA, 133319–133321.**References:** (1) Adams, J.W., T. Botinelly, W.N. Sharp, and K. Robinson (1974) Murataite, a new complex oxide from El Paso County, Colorado. *Amer. Mineral.*, 59, 172–176. (2) Portnov, A.M., L.S. Dubakina, and G.K. Krivokoneva (1981) Murataite in predicted association with landauite. *Doklady Acad. Nauk SSSR*, 261, 741–744 (in Russian). (3) Ercit, T.S. and F.C. Hawthorne (1995) Murataite, a UB₁₂ derivative structure with condensed Keggin molecules. *Can. Mineral.*, 33, 1223–1229.

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.