

Menzerite-(Y)

Crystal Data: Isometric. *Point Group:* $4/m\bar{3}2/m$. As cores in composite crystals to 0.07 mm.

Physical Properties: *Cleavage:* None. *Fracture:* n.d. *Tenacity:* Brittle.
Hardness = n.d. D(meas.) = n.d. D(calc.) = 4.31

Optical Properties: Transparent. *Color:* Dark reddish-brown in plane polarized light.
Streak: n.d. *Luster:* n.d.
R(air) = 8.83
Optical Class: Isotropic. $n = 1.844(20)$

Cell Data: *Space Group:* $Ia3d$. $a = 11.9947(6)$ $Z = 4$

X-ray Powder Pattern: Bonnet Island, near Parry Sound, Ontario, Canada [calculated pattern].
2.6821 (100), 1.6029 (44), 2.9987 (36), 2.4484 (33), 1.6634 (30), 1.3087 (18), 2.1899 (17)

Chemistry:	(1)		(1)
SiO ₂	30.64	Y ₂ O ₃	16.93
TiO ₂	1.10	Sc ₂ O ₃	0.17
CaO	13.92	V ₂ O ₃	0.17
MgO	3.98	Cr ₂ O ₃	0.04
MnO	0.85	<u>RE₂O₃</u>	<u>8.39</u>
FeO	11.82	Total	101.26
Fe ₂ O ₃	8.38		
Al ₂ O ₃	4.87		

(1) Bonnet Island, near Parry Sound, Ontario, Canada; average of 10 electron microprobe analyses, Fe³⁺ by stoichiometry; corresponding to
 $\{Y_{0.83}Gd_{0.01}Dy_{0.05}Ho_{0.02}Er_{0.07}Tm_{0.01}Yb_{0.06}Lu_{0.02}Ca_{1.37}Fe^{2+}_{0.49}Mn_{0.07}\}_{\Sigma=3.00}$
 $[Mg_{0.55}Fe^{2+}_{0.42}Fe^{3+}_{0.58}Al_{0.35}V_{0.01}Sc_{0.01}Ti_{0.08}]_{\Sigma=2.00}(Si_{2.82}Al_{0.18})O_{12}$.

Mineral Group: Garnet group; with Mg > Fe²⁺ and absence of Si in the Y structural site.

Occurrence: As cores and remnants in composite almandine crystals in a felsic granulite.

Association: Almandine.

Distribution: On the north shore of Bonnet Island, near Parry Sound, Ontario, Canada.

Name: Honors Gregor Menzer (1897-1989), German crystallographer who solved the garnet structure first and for the dominant rare earth component.

Type Material: Canadian Museum of Nature, Ottawa, Ontario, Canada; CMNMC 86088 and National Museum of Natural History, Washington, D.C., USA; NMNH 174896.

References: (1) Grew, E.S., J.H. Marsh, M.G. Yates, B. Lazic, T. Armbruster, A. Locock, S.W. Bell, M.D. Dyar, H-J. Bernhardt and O. Medenbach (2010) Menzerite-(Y), a new species, $\{(Y,REE)(Ca,Fe^{2+})_2\}[(Mg,Fe^{2+})(Fe^{3+},Al)](Si_3)O_{12}$, from a felsic granulite, Parry Sound, Ontario, and a new garnet end-member, $\{Y_2Ca\}[Mg_2](Si_3)O_{12}$. *Canadian Mineralogist*, 48, 1171-1193. (2) (2013) *Amer. Mineral.*, 98, 812-813 (abs. ref. 1).