Mendigite $Mn_2Mn_2MnCa(Si_3O_9)_2$

Crystal Data: Triclinic. *Point Group*: $\bar{1}$. As imperfect prismatic crystals, to 2.5 mm, flattened on {001}; in divergent sprays. *Twinning*: Polysynthetic twins ‖ (100).

Physical Properties: *Cleavage*: Perfect on {001}. *Fracture*: n.d. *Tenacity*: n.d. Hardness = n.d. D(meas.) = n.d. D(calc.) = 3.56

Optical Properties: Transparent. *Color*: Dark brown. *Streak*: Brown. *Luster*: Vitreous. *Optical Class*: Biaxial (-). α (calc.) = 1.722 β = 1.782(5) γ = 1.796(5) 2V(meas.) = 50(10)° 2V(calc.) = n.d. *Dispersion*: Medium, $r > v$.

Cell Data: *Space Group*: $P\bar{1}$. a = 7.0993(4) b = 7.6370(5) c = 7.7037(4) α = 79.58(1)° β = 62.62(1)° γ = 76.47(1)° Z = 1

X-ray Powder Pattern: Eifel Mountains, Rhineland-Palatinate (Rheinland-Pfalz), Germany. 2.885 (100), 1.774 (37), 3.72 (32), 3.000 (26), 3.199 (25), 2.691 (21), 2.397 (21)

Chemistry:	(1)
SiO_2	43.80
Al_2O_3	1.08
Fe_2O_3	4.42
Mn_2O_3	[2.91]
MnO	[37.47]
CaO	10.78
MgO	0.36
Total	100.82

(1) Eifel Mountains, Rhineland-Palatinate, Germany; average of 4 electron microprobe analyses, supplemented by IR spectroscopy, MnO/Mn_2O_3 calculated from structural data and charge-balance constraints; considering structural analysis, corresponds to $Mn_{2.00}(Mn_{1.33}Ca_{0.67})_{\Sigma=2.00}(Mn^{2+}_{0.50}Mn^{3+}_{0.28}Fe^{3+}_{0.15}Mg_{0.07})_{\Sigma=1.00}(Ca_{0.80}Mn^{2+}_{0.20})_{\Sigma=1.00}(Si_{5.57}Fe^{3+}_{0.27}Al_{0.16})_{\Sigma=6.00}O_{18}$.

Mineral Group: Bustamite group.

Occurrence: A pneumatolitic phase in miarolitic cavities in sanidinite.

Association: Sanidine, nosean, rhodonite, tephroite, magnetite, a pyrochlore-group mineral.

Distribution: From the In den Dellen near Mendig, Laacher Lake area, Eifel Mountains, Rhineland-Palatinate (Rheinland-Pfalz), Germany.

Name: For *Mendig*, the town in Germany, near the quarry that produced the first specimens.

Type Material: A.E. Fersman Mineralogical Museum, Russian Academy of Sciences, Moscow, Russia (4420/1).

References: (1) Chukanov, N.V., S.M. Aksenov, R.K. Rastsvetaeva, K.V. Van, D.I. Belakovskiy, I.V. Pekov, V.V. Gurzhiy, W. Schüller, and B. Ternes (2015) Mendigite, $Mn_2Mn_2MnCa(Si_3O_9)_2$, a new mineral species of the bustamite group from the Eifel Volcanic Region, Germany. Zap. Ross. Mineral. Obshch., 144, 48-60 (in Russian, English abstract); Geology of Ore Deposits, 57(8), 721-731 (in English). (2) (2016) Amer. Mineral., 101, 1715 (abs. ref. 1).