Monteneveite $Ca_3Sb^{5+}{}_2(Fe^{3+}{}_2Fe^{2+})O_{12}$

Crystal Data: Cubic. *Point Group*: $4/m\,\bar{3}\,2/m$. As equidimensional subhedral crystals to 400 μm.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: Subconchoidal.
Hardness = 6.5-7 VHN = 1072-1246, 1141 average (100 g load). D(meas.) = n.d.
D(calc.) = 4.72(1) Nonfluorescent.

Optical Properties: Opaque. *Color*: Black, gray in reflected light. *Streak*: Brownish black.
Luster: Adamantine.
Optical Class: Isotropic.
R: (470) 12.6, (546) 12.0, (589) 11.6, (650) 11.4

Cell Data: *Space Group: Ia*$\bar{3}$ *d*. a = 12.6093(2) Z = 8

X-Ray Diffraction Pattern: Monteneve mine, Passiria Valley, Bolzano Province, Italy.
4.45 (100), 2.571 (80), 3.147 (60), 1.683 (60), 2.814 (40), 1.993 (40), 1.575 (20)

Chemistry:

	(1)	(2)
CaO	23.67	23.26
FeO	[3.75]	9.93
Fe_2O_3	[29.54]	22.08
Sb_2O_5	39.81	44.73
SnO_2	2.22	
ZnO	2.29	
MgO	0.15	
MnO	0.03	
CoO	0.03	
Total	101.49	100.00

(1) Monteneve mine, Passiria Valley, Bolzano Province, Italy; average electron microprobe, and Raman and Mössbauer spectroscopic analyses, Fe^{3+}/Fe^{2+} for electroneutrality; corresponds to $(Ca_{2.97}Mg_{0.03})_{\Sigma=3.00}(Sb^{5+}{}_{1.73}Sn^{4+}{}_{0.10}Fe^{3+}{}_{0.17})_{\Sigma=2.00}(Fe^{3+}{}_{2.43}Fe^{2+}{}_{0.37}Zn_{0.20})_{\Sigma=3.00}O_{12}$.
(2) $Ca_3Sb^{5+}{}_2(Fe^{3+}{}_2Fe^{2+})O_{12}$.

Mineral Group: Garnet supergroup.

Occurrence: Formed near peak metamorphism (at ~600 °C) during partial breakdown of tetrahedrite-(Fe) by reactions with carbonate, under relatively oxidizing conditions.

Association: Magnetite, oxycalcioroméite, tetrahedrite-(Fe), sphalerite, chalcopyrite, anthophyllite, gudmundite, genplesite.

Distribution: From the Monteneve (Schneeberg) mine, Passiria Valley, Bolzano Province, Trentino-Alto Adige (Südtirol), Italy.

Name: For the type locality, the *Monteneve* (Schneeberg) mine.

Type Material: Department of Geosciences, Swedish Museum of Natural History, Stockholm, Sweden (GEO-NRM HS3903).

References: (1) Karlsson, A., D. Holtstam, L. Bindi, P. Bonazzi, and M. Konrad-Schmolke (2020) Adding complexity to the garnet supergroup: monteneveite, $Ca_3Sb^{5+}{}_2(Fe^{3+}{}_2Fe^{2+})O_{12}$, a new mineral from the Monteneve mine, Bolzano Province, Italy. Eur. J. Mineral., 32(1), 77-87.