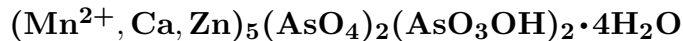


Villyaellenite



©2001-2005 Mineral Data Publishing, version 1

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals tabular, flattened on {100}, to prismatic, elongated along [001], showing {100}, {110}, {011}, {010}, { $\bar{1}01$ }, {001}, to 4 cm; in rosettes and radial aggregates.

Physical Properties: *Cleavage:* On {100}, good. Hardness = ~ 4 D(meas.) = 3.20–3.69 D(calc.) = 3.24–3.72

Optical Properties: Transparent. *Color:* Pale rose-red, orange-pink, colorless; colorless in transmitted light. *Streak:* White. *Luster:* Vitreous.

Optical Class: Biaxial (-). *Pleochroism:* Moderate; X = very pale orange-pink; Y = exceedingly pale orange-pink; Z = pale orange-pink. *Orientation:* $X = b$; $Y \wedge c = 30^\circ$ – 40° . *Absorption:* $Z \gg X > Y$. $\alpha = 1.660$ – 1.713 $\beta = 1.670$ – 1.723 $\gamma = 1.676$ – 1.729 $2V(\text{meas.}) = 70.5^\circ$ – 76° $2V(\text{calc.}) = 75^\circ$ – 75.6°

Cell Data: *Space Group:* $C2/c$. $a = 18.015$ – 18.515 $b = 9.261$ – 9.484 $c = 9.770$ – 10.000 $\beta = 96.238^\circ$ – 96.72° $Z = 4$

X-ray Powder Pattern: Sainte-Marie-aux-Mines, France.

3.297 (100), 8.476 (90), 3.132 (60), 4.606 (50), 4.761 (40), 3.811 (40), 3.025 (40)

Chemistry:

	(1)	(2)
As ₂ O ₅	52.99	50.6
FeO		0.1
MnO	22.40	36.2
ZnO		2.9
CaO	13.58	0.5
H ₂ O	11.42	9.9
Total	100.39	100.2

(1) Sainte-Marie-aux-Mines, France; by electron microprobe, total Mn as MnO, H₂O by TGA; corresponds to H_{2.27}(Mn_{2.69}Ca_{2.07}) $\Sigma=4.76$ (AsO₄)_{3.93}•4.28H₂O. (2) Mapimí, Mexico; by electron microprobe, average of five points over several crystals; total Mn as MnO, H₂O by moisture evolution analyzer; corresponds to (Mn_{4.62}Zn_{0.32}Ca_{0.08}Fe_{0.01}) $\Sigma=5.03$ (AsO₄)_{2.08}(AsO₃OH)_{1.92}•4.04H₂O.

Occurrence: A rare post-mine low-temperature reaction product of carbonate gangue with arsenical solutions derived from arsenic (Sainte-Marie-aux-Mines, France); on a museum specimen from the oxidized zone of an arsenic-rich base metal deposit (Mapimí, Mexico); on a single specimen from a metamorphosed stratiform zinc orebody (Sterling Hill, New Jersey, USA).

Association: Fluckite, picropharmacolite, pharmacolite, arsenic (Sainte-Marie-aux-Mines, France); ogdensburgite, arseniosiderite, chalcophanite, adamite, Fe–Mn oxides (Mapimí, Mexico); manganoan calcite, willemite, franklinite (Sterling Hill, New Jersey, USA).

Distribution: Found at Sainte-Marie-aux-Mines, Haut-Rhin, France. From Jáchymov (Joachimsthal), Czech Republic. Large crystals at the Ojuela mine, Mapimí, Durango, Mexico. In the Veta Negra mine, Pampa Larga district, Tierra Amarilla, southeast of Copiapó, Chile. From Sterling Hill, Ogdensburg, Sussex Co., New Jersey, USA. At the Gozaisho mine, Iwaki, Fukushima Prefecture, Japan.

Name: To honor Dr. Villy Aellen, Director, Natural History Museum, Geneva, Switzerland.

Type Material: Natural History Museum, Geneva, Switzerland, 435/76.

References: (1) Sarp, H. (1984) Villyaellenite, H₂(Mn, Ca)₅(AsO₄)₄•4H₂O un nouveau minéral de Sainte-Marie aux Mines (France). Schweiz. Mineral. Petrog. Mitt., 64, 323–328 (in French with English abs.). (2) (1986) Amer. Mineral., 71, 1547 (abs. ref. 1). (3) Kampf, A.R. and C.R. Ross II (1988) End-member villyaellenite from Mapimi, Durango, Mexico: descriptive mineralogy, crystal structure, and implications for the ordering of Mn and Ca in type villyaellenite. Amer. Mineral., 73, 1172–1178.

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.