Armenite $BaCa_2Al_6Si_9O_{30}\cdot 2H_2O$

©2001 Mineral Data Publishing, version 1.2

Crystal Data: Orthorhombic, pseudohexagonal. *Point Group:* $2/m\ 2/m\ 2/m$. Sheaves of prismatic crystals, with individuals to 2.5 cm. *Twinning:* Complex, showing sectored triplets; may be lamellar.

Physical Properties: *Cleavage:* Perfect prismatic, one pinacoidal distinct; partings along sector boundaries. Hardness = 7–8 D(meas.) = 2.74–2.76 D(calc.) = 2.787

Optical Properties: Translucent. *Color:* Colorless, fawn, greyish green. *Luster:* Vitreous. *Optical Class:* Biaxial (–), with uniaxial (–) domains. *Orientation:* $X = c$; $Z = b$. $\alpha = 1.550$–1.551 $\beta = 1.557$–1.559 $\gamma = 1.559$–1.562 2V(meas.) = 60°–65° 2V(calc.) = 57.8°

Cell Data: *Space Group: Pnna.* $a = 13.874(2)$ $b = 18.660(2)$ $c = 10.698(1)$ Z = 4

X-ray Powder Pattern: Kongsberg, Norway. (ICDD 20-112).
3.86 (100), 3.41 (90), 2.91 (90), 6.94 (80), 2.78 (80), 4.25 (65), 9.31 (55)

Chemistry:

	(1)	(2)	(3)
SiO_2	46.18	47.6	47.10
Al_2O_3	27.52	27.0	26.64
CaO	9.99	9.50	9.77
SrO	0.04	0.62	
BaO	12.37	12.05	13.35
Na_2O	0.16	0.36	
K_2O	0.13	0.15	
H_2O^+	3.41		
H_2O^-	0.11		
H_2O		2.90	3.14
CO_2		0.31	
Total	99.91	100.49	100.00

(1) Kongsberg, Norway. (2) Rémigny, Canada; by electron microprobe; average of 38 analyses on six samples; corresponds to $(Ba_{0.89}Na_{0.10}K_{0.04})_{\Sigma=1.03}(Ca_{1.92}Sr_{0.07}Na_{0.03})_{\Sigma=2.02}$ $Al_{3.02}(Al_3Si_9O_{30})\cdot 2[(H_2O)_{0.91}(CO_2)_{0.04}]$. (3) $BaCa_2Al_6Si_9O_{30}\cdot 2H_2O$.

Mineral Group: Milarite group (?).

Occurrence: In calcite veins (Kongsberg, Norway); in manganese-metasomatized diorite included in later granodiorite (Rémigny, Canada).

Association: Axinite, pyrrhotite, quartz (Kongsberg, Norway); albite, manganiferous zoisite, piemontite, prehnite, epidote, muscovite (Rémigny, Canada); celsian, bytownite (Broken Hill, Australia).

Distribution: From the Armen mine, near Kongsberg, Norway. In the Su Zurfuru mine, Fluminese, Sardinia, Italy. Large crystals from the Wasenalp, near Simplon, Valais, Switzerland. At Coire Loch Kander, 11 km south-southeast of Braemar, Scotland. From Chvaletice, Czech Republic. At Rémigny, Quebec, Canada. From 16 km northeast of North Bend, King Co., Washington, USA. At Broken Hill and Pernamoota, 30 km north of Broken Hill, New South Wales, Australia.

Name: For the Armen mine, Kongsberg, Norway.

Type Material: National School of Mines, Paris, France; The Natural History Museum, London, England, 1947,290.

References: (1) Neumann, H. (1939) Armenite, a new mineral. Preliminary note. Norsk. Geol. Tidsskr., 19, 312–313. (2) (1941) Amer. Mineral., 26, 235 (abs. ref. 1). (3) Puoliot, G., P. Trudel, G. Valiquette, and P. Samson (1984) Armenite-thulite-albite veins at Rémigny, Quebec: the second occurrence of armenite. Can. Mineral., 22, 453–464. (4) Armbruster, T. and M. Czank (1992) H_2O ordering and superstructures in armenite, $BaCa_2Al_6Si_9O_{30}\cdot 2H_2O$: a single-crystal X-ray and TEM study. Amer. Mineral., 77, 422–430.

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.