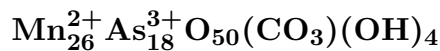


## Armangite



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**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3}$ . As tiny short hexagonal prisms, terminated by a trigonal pyramid. *Twinning:* On  $\{11\bar{2}0\}$ .

**Physical Properties:** *Cleavage:*  $\{0001\}$ , fair to poor. Hardness =  $\sim 4$  D(meas.) = [4.43] (calculated from material with 12% admixed carbonate). D(calc.) = 4.406

**Optical Properties:** Opaque, transparent in thin fragments. *Color:* Black to pale brown; yellow to brown in transmitted light. *Streak:* Brown.

*Optical Class:* Uniaxial (-).  $\omega = 2.01$   $\epsilon = 1.99$

**Cell Data:** *Space Group:*  $P\bar{3}$ .  $a = 13.491(2)$   $c = 8.855(1)$   $Z = 1$

**X-ray Powder Pattern:** Långban, Sweden. (ICDD 19-780).

2.762 (100), 2.94 (70), 2.428 (70), 1.759 (60), 3.92 (50), 1.676 (50), 1.459 (50)

### Chemistry:

	(1)	(2)	(3)
As <sub>2</sub> O <sub>3</sub>	42.92	48.82	48.06
Sb <sub>2</sub> O <sub>3</sub>	0.40	0.46	
FeO	2.19	2.49	
MnO	45.06	47.06	49.78
PbO	0.32	0.36	
MgO	0.49		
CaO	2.83		
H <sub>2</sub> O	0.71	0.81	0.97
CO <sub>2</sub>	5.08		1.19
insol.	0.20		
Total	100.20	[100.00]	100.00

(1) Långban, Sweden; average of three analyses. (2) Do.; recalculated to 100% after deduction of insoluble and (Ca, Mn, Mg)CO<sub>3</sub> 3.69%; essential CO<sub>3</sub> however was found by crystal-structure analysis and confirmed qualitatively by electron microprobe. (3) Mn<sub>26</sub>As<sub>18</sub>O<sub>50</sub>(CO<sub>3</sub>)(OH)<sub>4</sub>.

**Occurrence:** On a museum specimen collected from a metamorphosed Fe–Mn deposit.

**Association:** Calcite, dolomite, barite, hematite, fluorite, manganarsite, hausmannite.

**Distribution:** From Långban, Värmland, Sweden.

**Name:** For ARsenic and MANGanese in the composition.

**Type Material:** Swedish Museum of Natural History, Stockholm, Sweden, Flink U71; National Museum of Natural History, Washington, D.C., USA, R5795.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 1031–1032. (2) Moore, P.B. and T. Araki (1979) Armangite, Mn<sub>26</sub><sup>2+</sup>[As<sub>6</sub><sup>3+</sup>(OH)<sub>4</sub>O<sub>14</sub>][As<sub>6</sub><sup>3+</sup>O<sub>18</sub>]<sub>2</sub>[CO<sub>3</sub>], a fluorite derivative structure. Amer. Mineral., 64, 748–757.