Aspedamite $\square_{12}(Fe^{3+},Fe^{2+})_3Nb_4[Th(Nb,Fe^{3+})_{12}O_{42}]\{(H_2O),(OH)\}_{12}$

Crystal Data: Cubic. *Point Group*: $2/m\,\bar{3}$. As dodecahedral crystals with cube modifications to 50 μm.

Physical Properties: *Cleavage*: None. *Fracture*: Hackly. *Tenacity*: Brittle. Hardness = 3-4
D(meas.) = n.d. D(calc.) = 4.070

Optical Properties: Transparent. *Color*: Brownish orange to deep red. *Streak*: Very pale orange. *Luster*: Adamantine.
Optical Class: Isotropic. *n*(calc.) = 2.084

Cell Data: *Space Group*: *Im*3. a = 12.9078(6) Z = 2

X-ray Powder Pattern: Herrebøkasa quarry, Aspedammen, Østfold county, Norway.
9.107 (100), 2.635 (36), 2.889 (33), 1.726 (29), 3.233 (28), 3.454 (18), 4.567 (15)

Chemistry:

	(1)		(1)
SiO	20.78	Nb_2O_5	65.64
ThO_2	5.64	Ta_2O_5	1.78
TiO_2	2.15	La_2O_3	0.52
Fe_2O_3	10.56	Ce_2O_3	1.62
FeO	[2.73]	Nd_2O_3	0.44
MnO	0.82	H_2O	[7.20]
CaO	0.28	Total	100.32
K_2O	0.16		

(1) Herrebøkasa quarry, Aspedammen, Østfold county, Norway; average of 10 electron microprobe analyses, H_2O calculated from structure analysis, presence of OH and H_2O confirmed by Raman spectroscopy, FeO calculated from structure analysis; corresponding to $K_{0.09}Ca_{0.13}Ce_{0.26}La_{0.08}Nd_{0.07}Fe^{2+}_{1.00}Mn_{0.30}Fe^{3+}_{3.48}Th_{0.56}Ti^{4+}_{0.71}Si_{0.34}Nb_{12.98}Ta_{0.21}O_{42}(H_2O)_9(OH)_3$.

Occurrence: In a complex granitic pegmatite on altered monazite.

Association: Monazite.

Distribution: Herrebøkasa quarry, 2 km north-northeast of Aspedammen, Østfold county, Norway.

Name: For the village near which the first specimens were collected.

Type Material: Department of Natural History, Royal Ontario Museum, Toronto, Canada (M56117).

References: (1) Cooper, M.A., Y.A. Abdu, N.A. Ball, P. Černý, F.C. Hawthorne, and R. Kristiansen (2012) Aspedamite, ideally $\square_{12}(Fe^{3+},Fe^{2+})_3Nb_4[Th(Nb,Fe^{3+})_{12}O_{42}]\{(H_2O),(OH)\}_{12}$, a new heteropolyniobite mineral species from the Herrobøkasa quarry, Aspedammen, Østfold, Southern Norway: Description and crystal structure. Can. Mineral., 50, 793-804. (2) (2014) Amer. Mineral., 99, 1511-1512 (abs. ref. 1).