Harmotome $(Ba,K)_{1-2}(Si,Al)_8O_{16}\cdot 6H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Crystals elongated ‖ [001] or tabular ‖ {010}; typically striated on {010} ‖ [001]. Commonly as interpenetrant twins, to 4 cm, alone, in groups, or radiating aggregates. *Twinning:* Repeated on {001}, {021}, {110}; three double twins may further twin to simulate a pseudotetragonal prism or dodecahedron.

Physical Properties: *Cleavage:* {010} distinct, {001} poor. *Fracture:* Uneven to subconchoidal. *Tenacity:* Brittle. Hardness = 4.5 D(meas.) = 2.41–2.47 D(calc.) = 2.448

Optical Properties: Transparent to translucent. *Color:* Colorless, white, gray, yellow, pink, brown; colorless in thin section. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (+). *Orientation:* $Z = b$; $X \wedge a = 63°–67°$. *Dispersion:* Weak, crossed.
$\alpha = 1.503–1.508$ $\beta = 1.505–1.509$ $\gamma = 1.508–1.514$ 2V(meas.) = ∼80°

Cell Data: *Space Group:* $P2_1/m$. $a = 9.8688(21)$ $b = 14.1295(7)$ $c = 8.7092(9)$
$\beta = 124.74°$ Z = 2

X-ray Powder Pattern: Korsnäs mine, Finland.
6.38 (100), 3.13 (80), 2.670 (70), 4.08 (60), 3.24 (60), 3.17 (60), 2.730 (60)

Chemistry:

	(1)	(2)	(3)
SiO_2	48.49	47.52	49.80
Al_2O_3	16.35	16.94	14.09
BaO	20.08	20.25	21.18
Na_2O	trace	1.09	
K_2O	2.07	1.00	
H_2O	13.00	13.45	14.93
Total	99.99	100.25	100.00

(1) St. Andreasberg, Germany. (2) Strontian, Scotland. (3) $BaSi_6Al_2O_{16}\cdot 6H_2O$.

Mineral Group: Zeolite group.

Occurrence: Of hydrothermal origin, in cavities in basalts, phonolites, trachytes; in gneisses, and in some ore veins.

Association: Zeolites, calcite, leucite, hyalophane, strontianite, quartz, kaolinite, barite, pyrite, sphalerite, galena.

Distribution: Many occurrences; some for well-studied material follow. In Germany, from St. Andreasberg, Harz Mountains; at Idar-Oberstein, Rhineland-Palatinate; and on the Silberberg, near Bodenmais, Bavaria. At Příbram, Czech Republic. From Sarrabus, Sardinia, Italy. Fine crystals from Strontian, Argyllshire, Scotland. From Kongsberg, Norway. At Kupferberg-Rudelstadt, Silesia, Poland. In the Korsnäs lead mine, south of Vaasa, Finland. In Russia, large crystals at Bukan, in the Kotuy River basin, Taimyr. In the USA, from Glen Riddle, Delaware Co., Pennsylvania; at Sing Sing, near Ossining, Westchester Co., New York. In the Beaver mine, Thunder Bay district, Ontario, Canada. At Batopilas, Chihuahua, Mexico.

Name: From the Greek *harmos*, for *a joint*, and *tome*, for *a cutting*, as the twinned crystals may be divided.

Type Material: Natural History Museum, Paris, France.

References: (1) Dana, E.S. (1892) Dana's system of mineralogy, (6th edition), 581–583. (2) Deer, W.A., R.A. Howie, and J. Zussman (1963) Rock-forming minerals, v. 4, framework silicates, 386–400. (3) Sahama, T.G. and M. Lehtinen (1967) Harmotome from Korsnäs, Finland. Mineral. Mag., 36, 444–448. (4) Stuckenschmidt, E., H. Fuess, and Å. Kvick (1990) Investigation of the structure of harmotome by X-ray (293 K, 100 K) and neutron diffraction (15 K). Eur. J. Mineral., 861–874.