$Ba_4Ca_{5.4}(Al_{0.4}Si_{0.6})_{20}[SO_4]_3O_{39}[OH]_2[H_2O]_{0.5}$	*hP*110	(189) *P*-62*m* – $l^4k^2ji^4h^2gf^2ea$

$Ba_4Ca_{5.4}Al_8Si_{12}O_{39}(SO_4)_3(OH)_2{\cdot}0.5H_2O$ [1], wenkite, zeolite WEN
Structural features: $(Si,Al)O_4$ tetrahedra share vertices to form a WEN-type zeolite framework with cancrinite-type cages (six 4-rings, two planar and three non-planar 6-rings) interconnected via hexagonal prisms, and channels delimited by 10-rings perpendicular to [001] and by 8-rings parallel to [001]; SO_4 tetrahedra, Ca and Ba atoms in the channels.

Wenk H.R. (1973) [1]
$Al_8Ba_{3.96}Ca_{4.92}H_{2.48}O_{53.24}S_3Si_{12}$
a = 1.3515, c = 0.7465 nm, c/a = 0.552, V = 1.1808 nm^3, Z = 1

site	Wyck.	sym.	*x*	*y*	*z*	occ.	atomic environment
O1	12*l*	1	0.101	0.594	0.106	0.5	non-coplanar triangle O_2S
M2	12*l*	1	0.1333	0.2668	0.218		tetrahedron O_4
O3	12*l*	1	0.179	0.394	0.318		non-colinear Si_2
Ca4	12*l*	1	0.2243	0.4996	0.012	0.41	
M5	6*k*	*m*..	0.1378	0.4384	$^1/_2$		tetrahedron O_4
O6	6*k*	*m*..	0.207	0.583	$^1/_2$		non-coplanar triangle Si_3
O7	6*j*	*m*..	0.15	0.294	0		non-colinear Si_2
O8	6*i*	..*m*	0.171	0	0.281		non-colinear Si_2
O9	6*i*	..*m*	0.57	0	0.173	0.5	non-coplanar triangle O_2S
Ba10	6*i*	..*m*	0.6073	0	0.4788	0.5	
O11	6*i*	..*m*	0.784	0	0.292		non-colinear Si_2
(OH)12	4*h*	3..	$^1/_3$	$^2/_3$	0.18	0.5	single atom Si
M13	4*h*	3..	$^1/_3$	$^2/_3$	0.397	0.5	trigonal bipyramid $Si(OH)O_3$
O14	3*g*	*m*2*m*	0.4	0	$^1/_2$		non-colinear Si_2
O15	3*f*	*m*2*m*	0.408	0	0		single atom S
S16	3*f*	*m*2*m*	0.5169	0	0		7-vertex polyhedron O_7
Ba17	2*e*	3.*m*	0	0	0.485	0.48	
(OH_2)18	1*a*	-62*m*	0	0	0	0.24	trigonal prism O_6

M2 = 0.6Si + 0.4Al; M5 = 0.6Si + 0.4Al; M13 = 0.6Si + 0.4Al
Transformation from published data: -*x*,-*y*,-*z*; origin shift 0 0 $^1/_2$
Experimental: single crystal, diffractometer, X-rays, R = 0.046

Remarks: Natural specimen from Ivrea region, the Alps. Cation content $Ba_{3.96}(Ca_{4.89}Na_{0.68}K_{0.14})Al_{8.64}Si_{11.36}S_{2.61}$ from electron microprobe analysis (of another sample). Cell parameters from [2]. Average structure; the authors state that true symmetry is trigonal, space group (157) *P*31*m*. Short interatomic distances for partly occupied site(s). Hydrogen atoms are not taken into consideration for Pearson symbol, Wyckoff sequence and atomic environments. In table 2 of [1] the occupancy of former O(10) is misprinted as $^1/_2$ instead of 1 (from the description of the structure).

References: [1] Wenk H.R. (1973), Z. Kristallogr. 137, 113-126. [2] Wenk H.R. (1966), Schweiz. Mineral. Petrogr. Mitt. 46, 85-88.