$KNa_9Ba_6Ca_2Ti_6Mn_6Si_{36}B_{12}O_{123}[OH]_2$	*hP*203	(175) $P6/m - l^{13}k^4j^2gfdca$

$KNa_9Ba_6Ca_2(Mn,Fe)_6(Ti,Nb,Ta)_6Si_{36}B_{12}O_{114}O_9(OH)_2$ [1], tienshanite
Structural features: Branched 6-rings formed by eighteen vertex-linked SiO_4 tetrahedra are interconnected via TiO_6 octahedra and rings of edge-linked MnO_5 square pyramids on one side and units of two vertex-linked BO_4 tetrahedra on the other side to form a 3D-framework; K, Na and Ca in the layers containing the O atoms belonging to two BO_4 tetrahedra, Ba and OH in the TiMn layers.

Malinovskii I.A. et al. (1977) [1]
$B_{12}Ba_6Ca_2H_2KMn_6Na_9O_{125}Si_{36}Ti_6$
a = 1.6772, c = 1.0434 nm, c/a = 0.622, V = 2.5419 nm^3, Z = 1

site	Wyck.	sym.	x	y	z	occ.	atomic environment
Si1	12*l*	1	0.015	0.363	0.215		tetrahedron O_4
O2	12*l*	1	0.021	0.372	0.363		non-colinear SiTi
O3	12*l*	1	0.027	0.187	0.366		single atom Si
Si4	12*l*	1	0.029	0.192	0.221		tetrahedron O_4
O5	12*l*	1	0.044	0.288	0.16		non-colinear Si_2
O6	12*l*	1	0.076	0.459	0.138		non-colinear BSi
B7	12*l*	1	0.176	0.512	0.121		tetrahedron O_4
O8	12*l*	1	0.178	0.068	0.154		non-colinear Si_2
O9	12*l*	1	0.22	0.485	0.235		non-colinear BSi
O10	12*l*	1	0.414	0.09	0.16		non-colinear Si_2
Si11	12*l*	1	0.505	0.18	0.23		tetrahedron O_4
O12	12*l*	1	0.514	0.153	0.369		non-colinear SiTi
O13	12*l*	1	0.594	0.207	0.138		non-colinear BSi
Ba14	6*k*	*m*..	0.1856	0.5067	$^1/_2$		pseudo Frank-Kasper $(OH)O_{10}$
Mn15	6*k*	*m*..	0.2207	0.0844	$^1/_2$		square pyramid O_5
O16	6*k*	*m*..	0.358	0.131	$^1/_2$		non-colinear TiMn
Ti17	6*k*	*m*..	0.4206	0.0707	$^1/_2$		octahedron O_6
O18	6*j*	*m*..	0.208	0.501	0		non-colinear B_2
Na19	6*j*	*m*..	0.342	0.155	0		monocapped trigonal prism O_7
O20	3*g*	2/*m*..	$^1/_2$	0	$^1/_2$		colinear Ti_2
Na21	3*f*	2/*m*..	$^1/_2$	0	0		coplanar square O_4
(OH)22	2*d*	-6..	$^1/_3$	$^2/_3$	$^1/_2$		coplanar triangle Ba_3
Ca23	2*c*	-6..	$^1/_3$	$^2/_3$	0		tricapped trigonal prism O_9
K24	1*a*	6/*m*..	0	0	0		hexagonal prism O_{12}

Transformation from published data: origin shift 0 0 $^1/_2$
Experimental: single crystal, diffractometer, X-rays, R = 0.083

Remarks: Hydrogen atoms are not taken into consideration for Pearson symbol, Wyckoff sequence and atomic environments. Splitting of the Na site in Wyckoff position 3*f* and the Ti site is reported in [2].

References: [1] Malinovskii I.A., Pobedimskaya E.A., Belov N.V. (1977), Dokl. Akad. Nauk SSSR 236, 863-865. [2] Cooper M.A., Hawthorne F.C., Grew E.S. (1998), Can. Mineral. 36, 1305-1310.