$[H_3O]_{2.61}Ce_{4.32}[SO_4]_9[H_2O]_{19.8}$	*hP*164	(176) $P6_3/m$ – $i^{10}h^5f^2ea$

$(H_3O)_{0.44}Ce_{0.88}[Ce_{0.08}(H_3O)_{0.14}](SO_4)_2{\cdot}4.4H_2O$ [1]
Structural features: $Ce(OH_2)_6O_3$ and CeO_6O_3 tricapped trigonal prisms share atoms with SO_4 tetrahedra (partial disorder) to form infinite slabs.

Filipenko O.S. et al. (2001) [1]
$Ce_{4.36}H_{46.32}O_{58.16}S_9$
a = 1.1049, c = 2.5219 nm, c/a = 2.282, V = 2.6663 nm^3, Z = 2

site	Wyck.	sym.	*x*	*y*	*z*	occ.	atomic environment
O1	12*i*	1	0.0392	0.391	0.0424		single atom S
S2	12*i*	1	0.0582	0.4725	0.0898		tetrahedron O_4
O3	12*i*	1	0.1245	0.4351	0.1321		single atom S
O4	12*i*	1	0.1603	0.6227	0.0801		single atom S
O5	12*i*	1	0.17	0.031	0.18	0.36	single atom O
O6	12*i*	1	0.218	0.227	0.094		single atom (OH_3)
O7	12*i*	1	0.344	0.514	0.2034		single atom O
O8	12*i*	1	0.469	0.238	0.0386		single atom Ce
O9	12*i*	1	0.475	0.237	0.176		single atom S
O10	12*i*	1	0.5327	0.0754	0.1077		single atom S
O11	6*h*	*m*..	0.03	0.39	$^1/_4$		non-colinear S_2
O12	6*h*	*m*..	0.252	0.104	$^1/_4$	0.36	single atom S
S13	6*h*	*m*..	0.4047	0.0943	$^1/_4$	0.36	non-colinear SO
S14	6*h*	*m*..	0.494	0.0773	$^1/_4$	0.64	single atom S
O15	6*h*	*m*..	0.574	0.004	$^1/_4$	0.64	single atom S
Ce16	4*f*	3..	$^1/_3$	$^2/_3$	0.1456		tricapped trigonal prism O_9
Ce17	4*f*	3..	$^1/_3$	$^2/_3$	0.6064		tricapped trigonal prism O_9
(OH_3)18	4*e*	3..	0	0	0.062		non-coplanar triangle O_3
Ce19	2*a*	-6..	0	0	$^1/_4$	0.36	9-vertex polyhedron O_9
H20	12*i*	1	0.089	0.125	0.186	0.36	
H21	12*i*	1	0.175	0.088	0.152	0.36	
H22	12*i*	1	0.21	0.04	0.123		
H23	12*i*	1	0.326	0.285	0.079		
H24	12*i*	1	0.407	0.229	0.019		
H25	12*i*	1	0.445	0.284	0.207		
H26	12*i*	1	0.462	0.163	0.19		
H27	12*i*	1	0.552	0.312	0.012		

Experimental: single crystal, diffractometer, X-rays, R = 0.062

Remarks: $(H_3O)_{0.44}(Ce^{3+})_{0.44}(Ce^{4+})_{0.44}[(Ce^{4+})_{0.08}(H_3O)_{0.14}](SO_4)_2{\cdot}4.4H_2O$. Part of O of the SO_4 groups not located. Short interatomic distances for partly occupied site(s). Hydrogen atoms are not taken into consideration for Pearson symbol, Wyckoff sequence and atomic environments.

References: [1] Filipenko O.S., Shilov G.V., Leonova L.S., Ponomarev V.I., Atovmyan L.O. (2001), Dokl. Chem. 380, 262-266 (Dokl. Akad. Nauk 380, 208-212).