$Ca_3Ge[CO_3]_{0.92}[SO_4]_{1.08}[OH]_6[H_2O]_{12}$	*hP*68	(176) $P6_3/m$ – $i^3h^3f^3b$

$Ca_3Ge(OH)_6(CO_3)_{0.92}(SO_4)_{1.08}\cdot 12H_2O$ [1], carraraite
Structural features: Units of three edge-linked $Ca([OH]_4[OH_2]_4)$ square antiprisms share edges with $Ge(OH)_6$ octahedra to form infinite chains parallel to [001]; SO_4 tetrahedra and CO_3 trigonal units (substitutional disorder) between the chains.

Merlino S., Orlandi P. (2001) [1]
$C_{0.92}Ca_3GeH_{30}O_{25.08}S_{1.08}$
a = 1.1056, c = 1.0629 nm, c/a = 0.961, V = 1.1252 nm^3, Z = 2

site	Wyck.	sym.	*x*	*y*	*z*	occ.	atomic environment
O1	12*i*	1	0.1269	0.1349	0.111		single atom Ge
O2	12*i*	1	0.3461	0.0153	0.0705		single atom Ca
O3	12*i*	1	0.6224	0.196	0.0379		
Ca4	6*h*	*m*..	0.2098	0.0122	$^1/_4$		square antiprism O_8
O5	6*h*	*m*..	0.2348	0.3985	$^1/_4$		single atom Ca
O6	6*h*	*m*..	0.4054	0.2593	$^1/_4$		single atom Ca
S7	4*f*	3..	$^1/_3$	$^2/_3$	0.011	0.54	
O8	4*f*	3..	$^1/_3$	$^2/_3$	0.1473	0.54	single atom S
C9	4*f*	3..	$^1/_3$	$^2/_3$	0.5379	0.46	
Ge10	2*b*	-3..	0	0	0		octahedron O_6
H11	12*i*	1	0.068	0.36	0.055		
H12	12*i*	1	0.179	0.191	0.084		
H13	12*i*	1	0.424	0.276	0.178		
H14	12*i*	1	0.465	0.108	0.07		
H15	6*h*	*m*..	0.229	0.503	$^1/_4$		
H16	6*h*	*m*..	0.253	0.326	$^1/_4$		

Transformation from published data: *y*,*x*,-*z*; origin shift 0 0 $^1/_2$
Experimental: twinned crystal, diffractometer, X-rays, R = 0.094

Remarks: Natural specimen from Gioia quarry, Colonnata valley, Carrara basin, Apuan Alps, Italy. 35.70 wt.% CaO, 18.15 wt.% GeO_2, and 16.19 wt.% SO_3 were found by electron microprobe analysis. 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] Merlino S., Orlandi P. (2001), Am. Mineral. 86, 1293-1301.