Taipingite-(Ce) $(Ce^{3+}{}_7Ca_2)_{\Sigma=9}Mg(SiO_4)_3[SiO_3(OH)]_4F_3$

Crystal Data: Hexagonal. *Point Group*: 3*m*. As subhedral grains to ~200 μm, commonly intergrown with *REE* minerals.

Physical Properties: *Cleavage*: None. *Tenacity*: Brittle. *Fracture*: Conchoidal. Hardness = ~5.5 D(meas.) = n.d. D(calc.) = 4.900(5)

Optical Properties: Translucent to transparent. *Color*: Light red to pinkish brown, pale brown to colorless in thin section. *Streak*: Grayish white. *Luster*: Vitreous.
Optical Class: Uniaxial (+). ω = 1.808(5) ε = 1.812(7) *Orientation*: *c* = *E*, *a* = *b* = *O*.

Cell Data: *Space Group*: *R*3*c*. *a* = 10.7246(3) *c* = 37.953(1) Z = 6

X-Ray Diffraction Pattern: Taipingzhen *REE* deposit, North Qinling Orogen, central China.
2.941 (100), 3.455 (95), 3.297 (85), 2.683 (65), 4.518 (50), 1.945 (40), 1.754 (40)

Chemistry:

	(1)	(2)		(1)	(2)
Ce_2O_3	35.44	65.15	ThO_2	0.17	
La_2O_3	14.38		CaO	1.99	6.26
Nd_2O_3	13.49		MgO	1.74	2.25
Pr_2O_3	3.67		Fe_2O_3	1.06	
Sm_2O_3	0.97		SiO_2	22.54	23.49
Gd_2O_3	0.23		P_2O_5	0.07	
Ho_2O_3	0.16		F	1.85	3.18
Tm_2O_3	0.13		Cl	0.05	
Lu_2O_3	0.16		H_2O	[2.50]	2.01
Y_2O_3	0.17		-O = (F, Cl)	0.79	0.92
			Total	99.9	100.00

(1) Taipingzhen *REE* deposit, North Qinling Orogen, central China; average electron microprobe, IR and Raman spectroscopic analyses, H_2O calculated from structure; corresponds to $(Ce_{4.02}La_{1.64}Nd_{1.49}Pr_{0.41}Sm_{0.10}Gd_{0.02}Ho_{0.02}Tm_{0.01}Lu_{0.02}Y_{0.03}Ca_{0.66}Mg_{0.05}Th_{0.01}\square_{0.51})_{\Sigma=9}(Mg_{0.75}Fe^{3+}{}_{0.25})_{\Sigma=1}(SiO_4)_3\{[SiO_3(OH)]_{3.98}[PO_3(OH)]_{0.02}\}_{\Sigma=4}[F_{1.81}(OH)_{1.17}Cl_{0.02}]_{\Sigma=3}$. (2) $(Ce_7Ca_2)Mg(SiO_4)_3[SiO_3(OH)]_4F_3$.

Mineral Group: Cerite group. The F-dominant analogue of cerite-(Ce).

Occurrence: In a hydrothermal vein-type *REE* deposit.

Association: Allanite-(Ce), gatelite-(Ce), törnebohmite-(Ce), fluocerite-(Ce), fluocerite-(La), fluorite, bastnäsite-(Ce), parisite-(Ce), calcite.

Distribution From the Taipingzhen rare earth element (*REE*) deposit in the North Qinling Orogen, central China.

Name: For the locality, *Taiping* town, from which the studied material was collected.

Type Material: Geological Museum of China, Beijing, People's Republic of China (M16084).

References: (1) Qu, K., X. Sima, G. Fan, G. Li, G. Shen, H. Chen, X. Liu, Q. Yin, T. Li, and Y. Wang (2020). Taipingite-(Ce), $(Ce_7, Ca_2)_{\Sigma 9}Mg(SiO_4)_3[SiO_3(OH)]_4F_3$, a new mineral from the Taipingzhen REE deposit, North Qinling Orogen, central China. Geoscience Frontiers, 11(6), 2339-2346.