

Sahamalite-(Ce)**(Mg, Fe²⁺)(Ce, La, Nd)₂(CO₃)₄**

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Crystal Data: Monoclinic. *Point Group:* 2/*m*. As prismatic euhedral crystals, to 0.2 mm, flattened on { $\bar{2}01$ }, complexly developed with {110}, {120}, {010}, { $\bar{1}31$ }, {011}, {012}, { $\bar{1}42$ }, in subparallel radiating aggregates.

Physical Properties: *Cleavage:* Poor on {010}; traces on { $\bar{2}01$ }. Hardness = n.d.
D(meas.) = 4.30 D(calc.) = 4.30

Optical Properties: Semitransparent. *Color:* Colorless.

Optical Class: Biaxial (-). *Orientation:* $Y = b$; $Z \wedge c = 29^\circ$. *Dispersion:* $r < v$, perceptible.

$\alpha = 1.679(2)$ $\beta = 1.776(2)$ $\gamma = 1.807(2)$ 2V(meas.) = 57° 2V(calc.) = 57°

Cell Data: *Space Group:* $P2_1/a$. $a = 5.894(1)$ $b = 16.116(3)$ $c = 4.612(1)$
 $\beta = 106.54(1)^\circ$ $Z = 2$

X-ray Powder Pattern: Mountain Pass, California, USA.

3.90 (10), 3.65 (10), 2.87 (10), 5.33 (7), 4.26 (7), 3.03 (7), 2.12 (7b)

Chemistry:

	(1)
CO ₂	31.7
Ce ₂ O ₃	31.4
(La, Nd) ₂ O ₃	[27.8]
FeO	2.0
MgO	6.1
insol.	0.5
Total	[99.5]

(1) Mountain Pass, California, USA; (La, Nd)₂O₃ calculated as the difference from R₂O₃ less Fe₂O₃ and CeO₂; R₂O₃ determined by spectrographic analysis as La₂O₃ 17.4%, Nd₂O₃ 7.3%, Pr₂O₃ 2.3%, Sm₂O₃ 0.7%, total 27.7%; corresponds to (Mg_{0.85}Fe_{0.15})_{Σ=1.00} [Ce_{1.06}(La, Nd)_{0.93}]_{Σ=1.99}(CO₃)_{4.00}.

Occurrence: A rare accessory mineral in a rare-earth-bearing barite-dolomite carbonatite (Mountain Pass, California, USA).

Association: Parisite, bastnäsite, barite, dolomite, ankerite, quartz, hematite (Mountain Pass, California, USA); dorrite, esseneite, titanian andradite, magnetite–magnesioferrite–spinel, plagioclase, gehlenite–åkermanite, wollastonite, ulvöspinel, nepheline, apatite (Durham Ranch, Wyoming, USA); synchysite, monazite, strontianite, quartz (Kangankunde, Malawi).

Distribution: In the USA, from Mountain Pass, San Bernardino Co., California, and on the Durham Ranch, Powder River Basin, 13 km northeast of Reno Junction and 25 km south of Gillette, Campbell Co., Wyoming. At Kangankunde, Malawi.

Name: Honors Professor Thure Georg Sahama (1910–1983), Finnish geochemist and petrologist, University of Helsinki, Helsinki, Finland, who studied abundances of rare-earth elements.

Type Material: National Museum of Natural History, Washington, D.C., USA, 106901.

References: (1) Jaffe, H.W., R. Meyerowitz, and H.T. Evans, Jr. (1953) Sahamalite, a new rare earth carbonate mineral. *Amer. Mineral.*, 38, 741–754. (2) Pertlik, F. and A. Preisinger (1983) Crystal structure of sahamalite (Mg, Fe)RE₂(CO₃)₄. *Tschermaks Mineral. Petrog. Mitt.*, 31, 39–46.