

(Na _{0.93} Mn _{0.07}) ₁₅ (Y _{0.75} Ce _{0.15} Nd _{0.1}) ₂ [CO ₃] ₉ [SO ₃ F]Cl	<i>hP</i> 60	(174) <i>P</i> -6 – <i>l</i> ⁶ <i>k</i> ³ <i>j</i> ² <i>ihgeba</i>
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Na₁₅Y₂(CO₃)₉(SO₃F)Cl [1], reederite-(Y)

Structural features: (Y,Ce,Nd)₂(CO₃)₉ units (two base-linked (Y,Ce,Nd)O₆O₃ tricapped trigonal prisms sharing edges with six and vertices with three CO₃ trigonal units) are arranged in slabs containing also (Na,Mn), Cl and F (partial disorder for the latter), which alternate with layers containing SO₃ trigonal units (perpendicular to [001]) and additional (Na,Mn).

Grice J.D. et al. (1995) [1]

C₉Ce_{0.30}ClFMn_{1.05}Na_{13.95}Nd_{0.20}O₃₀SY_{1.50}

a = 0.8763, *c* = 1.0736 nm, *c/a* = 1.225, *V* = 0.7140 nm³, *Z* = 1

site	Wyck.	sym.	<i>x</i>	<i>y</i>	<i>z</i>	occ.	atomic environment
M1	6 <i>l</i>	1	0.01917	0.23653	0.2385		octahedron FO ₅
O2	6 <i>l</i>	1	0.10327	0.42443	0.3977		single atom C
O3	6 <i>l</i>	1	0.30857	0.44483	0.1543		single atom C
O4	6 <i>l</i>	1	0.36877	0.28733	0.2901		single atom C
C5	6 <i>l</i>	1	0.41457	0.40153	0.1997		coplanar triangle O ₃
O6	6 <i>l</i>	1	0.53117	0.10583	0.1596		single atom C
C7	3 <i>k</i>	<i>m</i> ..	0.02037	0.40103	¹ / ₂		coplanar triangle O ₃
M8	3 <i>k</i>	<i>m</i> ..	0.28037	0.29663	¹ / ₂		tricapped trigonal prism O ₆ ClC ₂
O9	3 <i>k</i>	<i>m</i> ..	0.49937	0.14383	¹ / ₂		single atom C
M10	3 <i>j</i>	<i>m</i> ..	0.11007	0.45423	0		monocapped trigonal prism O ₇
O11	3 <i>j</i>	<i>m</i> ..	0.17367	0.03373	0		single atom S
M12	2 <i>i</i>	3..	² / ₃	¹ / ₃	0.3219		tricapped trigonal prism O ₉
M13	2 <i>h</i>	3..	¹ / ₃	² / ₃	0.3017		octahedron O ₆
F14	2 <i>g</i>	3..	0	0	0.1467	0.5	single atom S
M15	1 <i>e</i>	-6..	² / ₃	¹ / ₃	0		trigonal prism O ₆
Cl16	1 <i>b</i>	-6..	0	0	¹ / ₂		coplanar triangle Na ₃
S17	1 <i>a</i>	-6..	0	0	0		trigonal bipyramid O ₃ F ₂

M1 = 0.93Na + 0.07Mn; M8 = 0.93Na + 0.07Mn; M10 = 0.93Na + 0.07Mn; M12 = 0.75Y + 0.15Ce + 0.10Nd; M13 = 0.93Na + 0.07Mn; M15 = 0.93Na + 0.07Mn

Transformation from published data: origin shift ¹/₃ ²/₃ ¹/₂

Experimental: single crystal, diffractometer, X-rays, wR = 0.031

Remarks: Natural specimen from Mont-Saint-Hilaire, Quebec. Composition Na_{13.63}Ca_{0.16}Mn_{0.22}Fe_{0.07}Al_{0.32}Y_{1.13}La_{0.11}Ce_{0.27}Pr_{0.03}Nd_{0.15}Sm_{0.04}Gd_{0.06}Er_{0.08}Dy_{0.09}Yb_{0.02}S_{0.79}C_{9.00}F_{1.22}Cl_{0.72}O_{30.51} from chemical analysis. We assigned approximate values to the cation ratios of sites M based on the chemical composition.

References: [1] Grice J.D., Gaula R.A., Chao G.Y. (1995), Am. Mineral. 80, 1059-1064.