Caresite $Fe^{2+}_4Al_2(OH)_{12}(CO_3)\cdot 3H_2O$

Crystal Data: Hexagonal. *Point Group*: 32. As tabular crystals to 0.5 mm in irregular aggregates.

Physical Properties: *Cleavage*: Perfect on {0001}. *Tenacity*: Brittle. *Fracture*: Uneven. Hardness = ~2 D(meas.) = 2.59(1) D(calc.) = 2.59 Nonfluorescent.

Optical Properties: Transparent. *Color*: Green-black. *Streak*: White. *Luster*: Vitreous. *Optical Class*: Uniaxial (-). ω = 1.599(1) ε = 1.570(1)

Cell Data: *Space Group*: $P3_112$ or $P3_212$ (3*T*). a = 10.805(3) c = 22.48(3) Z = 6

X-Ray Diffraction Pattern: Monteregian Hills, Quebec, Canada.
7.49 (100), 3.746 (50), 2.314 (50), 2.625 (40), 1.948 (40), 1.526 (20), 1.558 (15)

Chemistry:

	(1)	(2)
MgO	0.85	1.42
FeO	44.92	43.13
MnO	1.00	1.71
Al_2O_3	17.05	17.68
CO_2	[7.31]	[7.42]
H_2O	[26.84]	[28.33]
F	0.17	
-O = F	0.07	.
Total	98.07	98.69

(1) Mont Saint-Hilaire, Quebec, Canada; average electron microprobe analysis supplemented by IR spectroscopy, calculated stoichiometric CO_2, H_2O and OH; corresponds to $Fe^{2+}_{3.78}Mg_{0.13}Mn_{0.09}Al_{2.02}(OH)_{12}(CO_3)\cdot 3H_2O$. (2) Mont Royal, Montreal, Canada; average electron microprobe analysis supplemented by IR spectroscopy, stoichiometric CO_2, H_2O and OH; corresponds to $Fe^{2+}_{3.56}Mg_{0.21}Mn_{0.14}Al_{2.06}(OH)_{11.95}(CO_3)\cdot 3H_2O$.

Polymorphism & Series: 2*H* and 3*T* polytypes.

Mineral Group: Hydrotalcite supergroup, quintinite group.

Occurrence: A late-stage hydrothermal mineral in an alkaline complex.

Association: Microcline, analcime, natrolite, calcite, a vermiculite- or smectite-group mineral, chamosite, aegirine (Poudrette quarry); analcime, microcline, natrolite, tetanatrolite, aegirine, siderite, biotite, anatase, hematite, nordstrandite, dawsonite, berthierine, lovozerite, zircon, fluorite, pyrite (Mont Royal).

Distribution: From Poudrette quarry, Mont Saint-Hilaire, and the old Corporation quarry, Mont Royal, Montreal, Monteregian Hills, Quebec, Canada.

Name: Honors Stephen (b. 1909) and Janet (b. l921) *Cares*, amateur mineralogists from Sudbury, Massachusetts, USA, co-finders of the mineral, who have contributed significantly to the mineralogy of Mont Saint-Hilaire. Suffixes 2*H* and 3*T* denote the hexagonal and trigonal forms, respectively.

Type Material: Canadian Museum of Nature, Ottawa, Ontario (CMNMI 81550, CMNM 81551, and CMNI 81552 caresite-3*T*) and the Royal Ontario Museum, Toronto, Canada (M46772, M46773 and M46774 caresite-3*T*).

References: (1) Chao, G.Y. and R.A. Gault (1997) Quintinite-2*H*, quintinite-3*T*, charmarite-2*H*, charmarite-3*T* and caresite-3*T*, a new group of carbonate minerals related to the hydrotalcite - manasseite group. Can. Mineral., 35, 1541-1549. (2) Mills, S.J., A.G. Christy, J.-M.R. Génin, T. Kameda, and F. Colombo (2012) Nomenclature of the hydrotalcite supergroup: natural layered double hydroxides. Mineral. Mag., 76, 1289-1336.