Cordylite, $\text{BaCe}_2(\text{CO}_3)_3\text{F}_2$, was first described by Flink (1901) from Narsarsuuk, Greenland, where it occurred in small quantities with aegirine, synchysite, neptunite and aneylute in the pegmatite veins. The mineral has not been found outside Greenland until recently, when one of the unknown minerals, UK12 (Chao et al. 1967), from Mont St. Hilaire, Quebec, was identified as cordylite.

Only two small crystals of this rare mineral have been found on one specimen from the pegmatite dykes in nepheline syenite at Mont St. Hilaire. The crystals are poorly formed with hexagonal tabular habit in contrast to the prismatic habit of cordylite crystals from Greenland. The crystals display a rough pinacoid, prism and at least one pyramid (Fig. 1), and they measure about 2 mm across the pinacoid and 1.0 mm along the prism. The associated minerals are analeneite, aegirine, albite with minor amounts of biotite, rinkite, calcite, apatite, catapleiite, pyrochlore and pyrophaneite. The crystals are pale yellow with waxy luster on the crystal faces and vitreous luster on freshly exposed surfaces. The mineral is brittle with conchoidal fracture and has a good cleavage parallel to the basal pinacoid. The hardness is about 4½. The mineral is soluble with effervescence in HCl at room temperature. The optical properties of cordylite from Mont St. Hilaire are similar to those of the mineral from Greenland except that the refractive index $\omega$ is considerably higher (Table 1).

Precession and Weissenberg x-ray studies of five fragments from one crystal confirmed the space group symmetry, $P6_3/mmc$ and $P\bar{6}_2c$, reported for cordylite from Greenland (Donnay & Donnay 1955). Two weak diffuse reflections, 111 and 221, that violate the extinction rules, were observed on the x-ray photographs taken with MoKα radiation. These reflections were interpreted as due to Renninger effect because they were not observed on photographs taken with CuKα radiation. If these reflections were real, the space group for cordylite would become $P6/mmm$, $P\bar{6}2m$, $P\bar{6}m2$, $P\bar{6}mm$ or $P\bar{6}22$. The cell parameters of cordylite from Mont St. Hilaire, obtained by least-squares refinement with powder diffraction data, are similar to those of cordylite from Greenland (Table 1). The $a$ parameter reported by Ofteadal (1931) for the Green-

![Fig. 1. Scanning electron photomicrograph of cordylite crystal from Mont St. Hilaire, Quebec (center, approximately 2 mm in diameter).](image-url)
land cordylite is related to the $a$ parameter reported in this paper by a factor of $csc60^\circ$. The x-ray powder diffraction patterns of cordylite from the two localities are nearly identical (Table 2).

Electron microprobe analysis of cordylite from Mont. St. Hilaire is presented in Table 3. The contents of CO$_3$ and H$_2$O were not determined because of the limited amount of material available. Assuming a stoichiometric amount of CO$_3$, the analysis was calculated on the basis of eight cationic charges per formula to (Ba$_{0.80}$Ca$_{0.17}$Sr$_{0.03}$(Ce$_{0.77}$La$_{0.20}$Th$_{0.03}$)(CO$_3$)$_3$F$_{1.26}$.

The deficiency in F in the empirical formula, as compared with the ideal formula BaCe$_2$(CO$_3$)$_3$F$_{1.26}$, is most likely due to the omission of H$_2$O in the analysis. The H$_2$O is probably present in the mineral as a hydroxyl group. With $Z = 2$ the density of cordylite from Mont St. Hilaire calculated from the analysis, is 3.97 g/cm$^3$ and is somewhat lower than the density reported by other authors for cordylite from Greenland (Table 1).

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References
