Nitrocalcite $Ca(NO_3)_2 \cdot 4H_2O$

Crystal Data: Monoclinic. *Point Group:* $2/m$. Rare acicular crystals, in tufted and flowerlike aggregates, to 3 cm; more commonly as a cottony or massive efflorescence.

Physical Properties: *Cleavage:* Observed. Hardness = "Soft". D(meas.) = 1.90 (synthetic). D(calc.) = 1.91 Soluble in H_2O, taste sharp and bitter; deliquescent above about 54% relative humidity.

Optical Properties: Transparent. *Color:* Colorless to milky white; colorless in transmitted light. *Luster:* Silky.
Optical Class: Biaxial (–) (synthetic). *Orientation:* $X \perp$ cleavage. $\alpha = 1.465(3)$ $\beta = 1.498(3)$ $\gamma = 1.504(3)$ 2V(meas.) = 50(2)°

Cell Data: *Space Group:* $P2_1/n$ (synthetic). $a = 14.8999(12)$ $b = 9.1551(5)$ $c = 6.2786(7)$ $\beta = 106.22(1)°$ Z = 4

X-ray Powder Pattern: Synthetic. (ICDD 24-1406).
5.14 (100), 7.72 (70), 3.580 (70), 5.42 (65), 4.36 (55), 3.121 (55), 2.810 (55)

Chemistry: (1) Identified by correspondence of optical data and X-ray powder pattern with that of synthetic material.

Occurrence: Typically formed in caves and on alkaline soils, which may be seasonal.

Association: Niter, nitromagnesite (caves); alunite, aragonite, berlinite, collophane, crandallite, francoanellite, gypsum, huntite, hydromagnesite, leucophosphite, nesquehonite, niter (Paddy's River mine, Australia).

Distribution: From the Pulo di Molfetta caves, Apulia, Italy. At Limagne, Auvergne, France. In David's and Chaos Caves, Transvaal, South Africa. From Ludwig Cave, north Namibia. In the USA, in Kartchner Caverns, near Benson, Cochise Co., Arizona. From Paddy's River mine, Australian Capital Territory. Additional localities reported earlier require modern confirmation.

Name: For NITROgen and CALCium in the composition.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 306–307. (2) Hill, C. and P. Forti (1997) Cave minerals of the world (2nd edition), National Speleological Soc., Huntsville, Alabama, esp. 161–162. (3) Leclair, A. and J.C. Monier (1977) Liaisons hydrogène dans les cristaux de $Ca(NO_3)_2.4H_2O\alpha$. Acta Cryst., 33, 1861–1866 (in French with English abs.).