Lawrencite $(Fe^{2+}, Ni)Cl_2$

Crystal Data: Hexagonal. *Point Group:* $\overline{3}\ 2/m$. As massive efflorescences.

Physical Properties: *Cleavage:* {0001}, inferred from crystal structure. Hardness = Soft. D(meas.) = 3.16 (synthetic). D(calc.) = [3.26] Deliquescent.

Optical Properties: Translucent. *Color:* Green to brown; fresh synthetic material is white. *Optical Class:* Uniaxial (–); weak birefringence. $\omega = 1.567(5)$ ϵ = n.d.

Cell Data: *Space Group:* $R\overline{3}m$. a = 3.58 c = 17.5 Z = 3

X-ray Powder Pattern: Synthetic $FeCl_2$. (ICDD 1-1106).
2.54 (100), 5.9 (63), 1.800 (63), 3.07 (30), 1.467 (20), 1.138 (18), 1.953 (13)

Chemistry: Analyses of H_2O extracts of iron meteorites appear to agree with $FeCl_2$ with additional nickel; modern work does not support the species however, finding only akaganéite as the principal alteration product.

Occurrence: In iron meteorites, presumed to be a terrestrial alteration of meteoritic iron. Also as a volcanic sublimate.

Association: Iron, molysite.

Distribution: Noted in the Tazewell, Ovifak, Canyon Diablo, and other iron meteorites. At Vesuvius, Campania, Italy.

Name: Honors John Lawrence Smith (1818–1883), American chemist, mineralogist, and student of meteorites, who discovered the mineral.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 40. (2) Buchwald, V.F. and R.S. Clarke, Jr. (1989) Corrosion of Fe-Ni alloy by Cl-containing akaganéite (β-FeOOH): the Antarctic meteorite case. Amer. Mineral., 74, 656–667, esp. 663–664.