 Dickinsonite
\[ \text{KNa}_4\text{Ca(Mn}^{2+}, \text{Fe}^{2+})_{14}\text{Al(PO}_4\text{)}_{12}\text{(OH)}_2 \]

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Crystal Data: Monoclinic. Point Group: 2/m. Crystals are minute, tabular \{100\}, commonly pseudohomohedral, \{011\}, \{11T\}, and many \{h0l\} forms; striated on \{100\} giving a triangular pattern; curved, lamellar, radiated, stellated; foliated, micaceous, to several cm; disseminated scaly massive.


Optical Properties: Transparent to translucent. Color: Oil-green to olive-green, pale to dark grass-green, yellowish green to brownish green; green in transmitted light. Streak: White, nearly. Luster: Vitreous, pearly on cleavages. Optical Class: Biaxial (+). Pleochroism: X = pale olive-green; Y = paler olive-green; Z = very pale yellowish green. Orientation: X = b; Y \& c \approx 15\degree. Dispersion: r > v, moderate to strong. α = 1.648–1.658 β = 1.655–1.662 γ = 1.662–1.671 2V(meas.) = \leq 90\degree

Cell Data: Space Group: A2/a. a = 24.940(6) b = 10.131(4) c = 16.722(2) β = 105.60(2)\degree Z = 4

X-ray Powder Pattern: Branchville, Connecticut, USA; close to arrojadite. (ICDD 24-66). 3.04 (100), 2.717 (80), 3.22 (60), 2.85 (45), 5.93 (40), 2.770 (40), 2.554 (35)

Chemistry: (1) (2) (3)
- \(P_2O_5\) 39.57 39.5 39.67
- \(Al_2O_3\) 2.0 2.37
- \(FeO\) 13.25 13.3
- \(MnO\) 31.58 32.0
- \(MgO\) 0.0
- \(CaO\) 2.15

\(Li_2O\) 0.17 [0.17]
\(Na_2O\) 7.46 7.8 5.77
\(K_2O\) 1.52 1.1 2.19
\(H_2O\) 1.65 [1.65] 0.84
insol. 2.58

Total 99.93 [99.82] 100.00

(1) Branchville, Connecticut, USA. (2) Do.; by electron microprobe, total Fe as FeO, total Mn as MnO, Li2O and H2O from (1); corresponds to K0.49Li0.24Na0.33Ca0.87(Mn2+55Fe3+92)Σ=13.47Al0.83(PO4)11.78(OH)3.88. (3) KNa4Ca(Mn, Fe)14Al(PO4)12(OH)2 with Mn:Fe = 1:1.

Polymorphism & Series: Forms a series with arrojadite.

Occurrence: A high-temperature (\approx 800 \degree C) primary mineral in granite pegmatites.

Association: Eosphorite, triploidite, lithiophilite, rhodochrosite, reddingite, fieldfileite (Branchville, Connecticut, USA).

Distribution: In the USA, from Branchville, Fairfield Co., and in the Strickland quarry, Portland, Middlesex Co., Connecticut; in Maine, from Auburn and Poland, Androscoggin Co., and at Hebron, Greenwood, and Newry, Oxford Co.; from the White Picacho district, Maricopa and Yavapai Cos., Arizona; in the Nickel Plate mine, near Keystone, Pennington Co., South Dakota. At the Buranga pegmatite, near Gatumba, Rwanda.

Name: In honor of the Reverend John William Dickinson (1835–1899), Redding, Connecticut, USA, an early collector of Branchville minerals.

Type Material: Yale University, New Haven, Connecticut, Brush 3090; Harvard University, Cambridge, Massachusetts, 110679, 103812; National Museum of Natural History, Washington, D.C., USA, 80561.


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