

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. As crystals, to 0.5 mm, elongated along [100] and flattened on {010}, in fibrous, felted aggregates, to several cm.

Physical Properties: *Fracture:* Uneven. Hardness = ~ 4.5 D(meas.) = 6.402
D(calc.) = 6.39–7.20

Optical Properties: Transparent. *Color:* Pale creamy white to pale reddish pink; pale yellowish brown to dark brown. *Streak:* White. *Luster:* Dull, earthy in aggregates.
Optical Class: Biaxial (+); birefringence ~ 0.14 . *Pleochroism:* $X = Y =$ straw-yellow; $Z =$ light straw-yellow. *Orientation:* $X = c$; $Y = b$; $Z = a$. $\alpha = > 2.05$ $\beta = > 2.05$ $\gamma = > 2.05$
 $2V(\text{meas.}) =$ Moderate.

Cell Data: *Space Group:* $Pmnb$. $a = 7.505(1)$ $b = 11.063(2)$ $c = 5.370(1)$ $Z = 4$

X-ray Powder Pattern: San Diego mine, California, USA.
3.038 (100), 4.835 (90), 2.964 (90), 3.754 (70), 2.683 (50), 2.359 (50), 2.767 (35)

Chemistry:	(1)	(2)
Nb ₂ O ₅	14.2	10.23
Ta ₂ O ₅	66.6	74.6
SiO ₂	3.0	1.01
Sb ₂ O ₃	0.5	0.07
Bi ₂ O ₃	0.1	0.43
FeO	0.4	1.43
MnO	0.1	0.35
CaO	13.0	8.50
Total	97.9	96.62

(1) San Diego mine, California, USA; by electron microprobe, total Fe as FeO; corresponds to Ca_{1.11}(Ta_{1.44}Nb_{0.51})_{Σ=1.95}O₆. (2) Wampewo pegmatite, Uganda; by electron microprobe, total Fe as FeO; corresponds to (Ca_{0.75}Fe_{0.10}Mn_{0.02})_{Σ=0.87}(Ta_{1.67}Nb_{0.38})_{Σ=2.05}O₆.

Occurrence: A rare alteration product of earlier Nb–Ta minerals in some granite pegmatites.

Association: Fersmite, stibiotantalite, cassiterite, microlite, beyerite, tourmaline, albite, quartz (San Diego Co., California, USA); microlite, wadginitite, zircon, lepidolite, quartz (Wampewo pegmatite, Uganda).

Distribution: In the USA, from the Himalaya and San Diego mines, Mesa Grande district, San Diego Co., California; at the Brown Derby No. 1 pegmatite, Quartz Creek district, Gunnison Co., Colorado. In the Wampewo pegmatite, Gamba Hill, near Kampala, southwest Uganda.

Name: To honor Frederick James Rynerson (1882–1960), and his two sons, Buel Frederick Rynerson (1905–) and Eugene Bonfoey Rynerson (1910–), long-time pegmatite miners in San Diego Co., California, USA.

Type Material: National School of Mines, Paris, France; The Natural History Museum, London, England, 1977,144; National Museum of Natural History, Washington, D.C., USA, 135832, 135833, 136719, 149524.

References: (1) Foord, E.E. and M.E. Mrose (1978) Rynersonite, Ca(Ta, Nb)₂O₆, a new mineral from San Diego County, California. *Amer. Mineral.*, 63, 709–714. (2) von Knorring, O. and T.G. Sahama (1979) A note on rynersonite from Uganda. *Schweiz. Mineral. Petrolog. Mitt.*, 59, 15–18.