Paulkerrite $K(Mg,Mn^{2+})_2(Fe^{3+},Al)_2Ti(PO_4)_4(OH)_3 \cdot 15H_2O$

Crystal Data: Orthorhombic. *Point Group:* $2/m\ 2/m\ 2/m$. Equant crystals, to 0.2 mm, may be flattened on {010}, elongated along [001]; forms noted are {010}, {100}, {111}. *Twinning:* Multiple, parallel {010}, possible.

Physical Properties: *Cleavage:* On {100}, perfect. *Fracture:* Even. Hardness = ∼3 D(meas.) = 2.36(4) D(calc.) = 2.36

Optical Properties: Transparent. *Color:* Light yellowish brown to colorless. *Streak:* White. *Luster:* Vitreous.
Optical Class: Biaxial (–). *Orientation:* $X = c$; $Y = b$; $Z = a$. *Dispersion:* $r > v$, strong.
$\alpha = 1.591–1.598$ $\beta = 1.615–[1.624]$ $\gamma = 1.639–1.643$ 2V(meas.) = ∼80°

Cell Data: *Space Group: Pbca.* $a = 10.49(7)$ $b = 20.75(13)$ $c = 12.44(2)$ Z = 4

X-ray Powder Pattern: 7U7 Ranch, Arizona, USA.
6.20 (100), 10.3 (90), 7.46 (80), 3.13 (70), 3.75 (40), 2.872 (40), 3.95 (30)

Chemistry:

	(1)
P_2O_5	29.4
TiO_2	9.8
Al_2O_3	1.6
Fe_2O_3	12.2
MnO	7.1
MgO	4.6
K_2O	4.4
F	0.9
H_2O	[30.4]
$-O = F_2$	0.4
Total	[100.0]

(1) 7U7 Ranch, Arizona, USA; by electron microprobe, total Fe as Fe_2O_3, confirmed by microchemical test, total Mn as MnO, H_2O by difference; corresponds to $K_{0.90}(Mg_{1.04}Mn_{0.96})_{\Sigma=2.00}(Fe_{1.47}Al_{0.30}Ti_{0.18}Mg_{0.06})_{\Sigma=2.01}Ti_{1.00}(PO_4)_{3.98}[(OH)_{2.64}F_{0.46}]_{\Sigma=3.00} \cdot 14.98H_2O$.

Occurrence: An alteration product of triplite in complex zoned granite pegmatites.

Association: Triplite, bermanite, phosphosiderite, leucophosphite, strengite, switzerite (7U7 Ranch, Arizona, USA).

Distribution: From the 7U7 Ranch, 40 km west of Hillside, Bagdad district, Yavapai Co., Arizona, USA. In the Bendada pegmatite, near Guarda, Portugal.

Name: To honor Dr. Paul Francis Kerr (1897–1981), Professor of Mineralogy, Columbia University, New York City, New York, USA.

Type Material: National Museum of Natural History, Washington, D.C., USA, R7778, 120405, 163777.

References: (1) Peacor, D.R., P.J. Dunn, and W.B. Simmons (1984) Paulkerrite, a new titanium phosphate from Arizona. Mineral. Record, 15, 303–306. (2) (1985) Amer. Mineral., 70, 875 (abs. ref. 1).