

Crystal Data: Monoclinic. *Point Group:* 2/m. As rounded grains to 0.3 mm, as pseudomorphs after ilmenite. *Twining:* Observed in X-ray analysis.

Physical Properties: *Cleavage:* n.d. *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = n.d. $D(\text{meas.}) = 3.28$ [Low due to intragrain porosity.] $D(\text{calc.}) = 3.91$

Optical Properties: Translucent. *Color:* Red-brown, orange; yellow, red-brown to deep red in transmitted light; dark blue-gray in reflected light. *Streak:* Beige. *Luster:* Waxy to vitreous. *Optical Class:* Uniaxial (-). [Also biaxial (-) with $2V(\text{meas.}) = \sim 0^\circ$ in localized regions.] $n(\text{calc.}) = 2.16(3)$

Cell Data: *Space Group:* $P2_1/c$. $a = 7.537(1)$ $b = 4.5795(4)$ $c = 9.885(1)$ $\beta = 131.02(1)^\circ$
 $Z = \text{n.d.}$

X-ray Powder Pattern: Königshain, Saxony, Germany.
1.676 (100), 2.170 (82), 2.466 (27), 1.423 (22), 2.764 (9), 3.933 (8), 1.297 (6)

Chemistry:	(1)
TiO ₂	65.9
Fe ₂ O ₃	11.2
Al ₂ O ₃	4.20
SiO ₂	2.57
P ₂ O ₅	0.51
V ₂ O ₅	0.50
MnO	0.07
MgO	0.31
<u>H₂O</u>	<u>10.6</u>
Total	95.9

(1) Königshain, Saxony, Germany; average of 15 electron microprobe analyses, H₂O by TGA; corresponding to $\text{Fe}^{3+}_{1.01}\text{Mg}_{0.06}\text{Ti}_6\text{O}_{11.2}(\text{OH})_{4.8}[\text{Al}_{0.59}\text{Si}_{0.31}\text{P}_{0.04}\text{O}_{1.60} \cdot 1.8\text{H}_2\text{O}]$ - the components in square brackets contributed by inclusions.

Occurrence: In the heavy mineral fractions of marine sand deposits.

Association: MgO-rich ferrian ilmenite, pseudorutile, "leucoxene," tourmaline, spinel, kaolinite, quartz, diasporite.

Distribution: From Königshain, Saxony, northeast Germany; the Murray Basin, southeast Australia; and at Kalimantan, Indonesia.

Name: Honors Will Kleber (1906-1970), a former director of the Institute of Mineralogy and the Museum of Mineralogy, Humboldt University, Berlin, Germany.

Type Material: At the Natural History Museum, Humboldt University, Berlin, Germany (1980-0283) and the Museum Victoria, Melbourne, Victoria, Australia (M52010-M52011).

References: (1) Grey, I.E., K. Steinike, and C.M. MacRae (2013) Kleberite, $\text{Fe}^{3+}\text{Ti}_6\text{O}_{11}(\text{OH})_5$, a new ilmenite alteration product, from Königshain, northeast Germany. *Mineral. Mag.*, 77(1), 45-55.
(2) (2015) *Amer. Mineral.*, 100, 2354-2355 (abs. ref. 1).