

Crystal Data: Triclinic. *Point Group:* $\bar{1}$. As slightly elongated to rosette-like aggregates of subparallel plates, to 0.5 mm, exhibiting rough forms {110}, {001}, and {011}.

Physical Properties: *Cleavage:* One poor direction. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = 4.5 VHN = 530 (25 g load). D(meas.) = > 4.04 D(calc.) = 4.17

Optical Properties: Translucent. *Color:* Dark yellow. *Streak:* Very pale yellow. *Luster:* Adamantine.

Optical Class: Biaxial (-). $\alpha = 1.86(1)$ $\beta = 1.917$ (calc) $\gamma = 1.93(1)$ $2V\alpha = 50(5)^\circ$
Dispersion: Very strong, $r > v$. *Pleochroism:* Weak; X = nearly colorless to very pale yellow; Y = pale yellow to yellow; Z = yellow to dark yellow. *Absorption:* $Z > Y > X$.
Orientation: (polar coordinates in terms of ϕ and ρ based on (010) = $0^\circ/90^\circ$), $X(-113^\circ/85^\circ)$; $Y(155^\circ/70^\circ)$; $Z(-10^\circ/21^\circ)$.

Cell Data: *Space Group:* $P\bar{1}$. $a = 5.309(1)$ $b = 7.211(1)$ $c = 7.349(1)$ $\alpha = 87.74(3)^\circ$
 $\beta = 86.38(3)^\circ$ $\gamma = 71.40(3)^\circ$ $Z = 1$

X-ray Powder Pattern: Vereinigung mine, Taunus, Hesse, Germany.
 4.848 (100), 6.839 (64), 3.547 (57), 3.417 (52), 3.022 (51), 3.667 (47), 2.8339 (45)

Chemistry:	(1)
	PbO
	33.10
	Fe ₂ O ₃
	35.64
	P ₂ O ₅
	20.97
	<u>H₂O</u>
	9.32
	Total
	98.79

(1) Vereinigung mine, Taunus, Hesse, Germany; average of 46 electron microprobe analyses, H₂O from structure determination, anionic groups confirmed by IR, corresponding to $\text{Pb}_{1.00}\text{Fe}_{3.02}(\text{PO}_4)_{1.98}(\text{OH})_{5.12}(\text{H}_2\text{O})_{0.94}$

Mineral Group: Alunite group.

Occurrence: A secondary mineral on goethite in a weathered metallic sulfide mineral vein.

Association: Kintoreite, goethite, pyromorphite.

Distribution: On the dumps of the Vereinigung mine, near Eisenbach, ~5 km north of Bad Camberg, Taunus, Hesse, Germany.

Name: Honors Arthur Lindo Patterson (1902–1966), who developed a method employing a Fourier series to generate a three-dimensional function, the now well-known “Patterson function” in crystal-structure determination.

Type Material: Natural History Museum, Vienna, Austria.

References: (1) Kolitsch, U., H.-J. Bernhardt, W. Krause, and G. Blass (2008) Pattersonite, $\text{PbFe}_3(\text{PO}_4)_2(\text{OH})_4[(\text{H}_2\text{O})_{0.5}(\text{OH})_{0.5}]_2$, a new supergene phosphate mineral: description and crystal structure. *Eur. J. Mineral.*, 20, 281–288. (2) (2009) *Amer. Mineral.*, 94, 401–402 (abs. ref. 1).