

Crystal Data: Monoclinic. *Point Group:* 2/m. Granular and as lamellae (to 0.5 mm wide) intergrown with triphylite or products of its topotactic oxidation.

Physical Properties: *Cleavage:* Good on {010}. *Fracture:* Irregular. *Tenacity:* Brittle. Hardness = ~5 D(meas.) = n.d. D(calc.) = 3.592

Optical Properties: Transparent. *Color:* Pinkish brown, colorless in transmitted light.

Streak: Colorless. *Luster:* Vitreous.

Optical Class: Biaxial (+). $\alpha = 1.690(2)$ $\beta = 1.692(2)$ $\gamma = 1.710(5)$ $2V(\text{meas.}) = 40.1(6)^\circ$

$2V(\text{calc.}) = 37^\circ$ *Orientation:* $X \parallel b$, $Y \wedge a = 41.4^\circ$ in β obtuse, $Z \wedge a = 32.1^\circ$ in β acute.

Pleochroism: None.

Cell Data: Space Group: $P2_1/c$. $a = 8.792(2)$ $b = 11.743(2)$ $c = 6.169(1)$ $\beta = 99.35(3)^\circ$ $Z = 4$

X-ray Powder Pattern: Calculated pattern.

3.654 (100), 2.979 (85), 3.014 (77), 3.042 (76), 2.834 (68), 3.097 (57), 3.133 (56)

Chemistry:	(1)	(2)
P ₂ O ₅	44.52	41.54
FeO	29.13	42.05
MnO	12.14	
MgO	0.56	
CaO	16.17	16.41
Total	99.51	100.00

(1) Near Lutomia village, Lower Silesia, southwest Poland; average of 2 electron microprobe analyses supplemented by Raman and Mössbauer spectroscopy; corresponds to (Fe_{1.39}Ca_{0.98}Mn_{0.58}Mg_{0.05}) $\Sigma=3.00$ (PO₄)_{2.00}. (2) CaFe₂(PO₄)₂.

Polymorphism & Series: Forms series with beusite and graftonite members of the group.

Mineral Group: Graftonite group.

Occurrence: A common primary phosphate in beryl-columbite-phosphate subtype of zoned rare-element pegmatites related to anatexic melts, generated by partial melting of metasedimentary-metavolcanics rocks during amphibolite-facies metamorphism and migmatization.

Association: Sarcopsidite, graftonite-(Mn), maneckiite, triphylite oxidized topotactically to ferrisicklerite and heterosite.

Distribution: From two quarries near Lutomia village, ~5 km southeast of Świdnica and ~60 km southwest of Wrocław, Lower Silesia, southwest Poland.

Name: The suffix indicates the ^{M1}Ca-analogue of *graffonite*, ^{M(1)}Fe^{M(2),M(3)}Fe₂(PO₄)₂.

Type Material: Mineralogical Museum, University of Wrocław, Faculty of Earth Science and Environmental Management, Institute of Geological Sciences, Wrocław, Poland (MMWr IV7674).

References: (1) Pieczka, A., F.C. Hawthorne, N. Ball, Y. Abdu, B. Gołębiowska, A. Włodek, and J. Żukrowski (2018) Graftonite-(Mn), ideally ^{M1}Mn^{M2,M3}Fe₂(PO₄)₂, and graftonite-(Ca), ideally ^{M1}Ca^{M2,M3}Fe₂(PO₄)₂, two new minerals of the graftonite group from Poland. *Mineral. Mag.*, 82(6), 1307-1322. (2) (2020) *Amer. Mineral.*, 105(7), 972-973 (abs. ref. 1). (3) Hawthorne, F.C. and A. Pieczka (2018) Classification of the minerals of the graftonite group. *Mineral. Mag.*, 82(6), 1301-1306.