

**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  $\beta$  obtuse,  $Z \wedge a = 32.1^\circ$  in  $\beta$  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 <sub>2</sub> O <sub>5</sub>	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<sub>1.39</sub>Ca<sub>0.98</sub>Mn<sub>0.58</sub>Mg<sub>0.05</sub>) $\Sigma=3.00$ (PO<sub>4</sub>)<sub>2.00</sub>. (2) CaFe<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>.

**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 anatectic 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 <sup>MI</sup>Ca-analogue of *griftonite*, <sup>M(1)</sup>Fe<sup>M(2),M(3)</sup>Fe<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>.

**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 <sup>MI</sup>Mn<sup>M2,M3</sup>Fe<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>, and graftonite-(Ca), ideally <sup>MI</sup>Ca<sup>M2,M3</sup>Fe<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>, 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.