Isoferroplatinum Pt_3Fe

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. Rarely as crystals, to 3 mm, also skeletal and cubic grains, which may exhibit stepped facets, and as wormlike intergrowths and veinlets.

Physical Properties: Hardness = n.d. VHN = 503–572 (100 g load). D(meas.) = n.d. D(calc.) = 18.41

Optical Properties: Opaque. *Color:* Bright white in reflected light. *Luster:* Metallic. R: (400) 61.2, (420) 61.2, (440) 61.1, (460) 61.3, (480) 62.3, (500) 63.3, (520) 63.8, (540) 64.3, (560) 64.9, (580) 65.9, (600) 66.4, (620) 67.5, (640) 67.9, (660) 68.7, (680) 69.2, (700) 69.5

Cell Data: *Space Group:* $Pm3m$. $a = 3.866$ $Z = 1$

X-ray Powder Pattern: Gusevogorskii pluton, Russia. 1.164 (10), 2.22 (7), 1.364 (6), 1.926 (4), 1.114 (4)

Chemistry:

	(1)	(2)
Pt	90.2	91.29
Fe	7.6	8.71
Cu	0.94	
Ni	0.06	
Total	98.8	100.00

(1) Tulameen River, Canada; by electron microprobe, corresponding to $Pt_{3.01}(Fe_{0.88}Cu_{0.10}Ni_{0.01})_{\Sigma=0.99}$. (2) Pt_3Fe.

Occurrence: In Pt–Fe and Cu–Ni sulfide deposits in ultramafic rocks, also in chromatites, and placers derived from them.

Association: Platinum, iridium, osmium, Pt–Fe alloy, braggite, sperrylite, inclusions of many other PGE minerals, gold, pyrite.

Distribution: In Canada, in British Columbia, from the Tulameen [TL] and Similkameen Rivers. In the Stillwater complex, Montana, and at Fox Gulch, Goodnews Bay, Alaska, USA. From the Department of Chocó, Cauca, Colombia. In the Inagli and Konder massifs, Aldan Shield, Sakha; the Noril'sk region, western Siberia; along the Vilyui River and on the Kamchatka Peninsula; in the Gusevogorskii pluton and the Kytlym and Uktus complexes, Ural Mountains; and at a number of other minor localities in Russia. From the Birbir River, Ethiopia. In the Onverwacht and Tweefontein pipes, Merensky Reef, Bushveld complex, Transvaal, South Africa. On the Riam Kanan River, Borneo. From the Qilian Mountains, Qinghai Province, China. At Round Hill, near Orepuki, New Zealand. Numerous additional localities have been recognized.

Name: For the cubic (ISOmetric) structure, and iron (FERRum) and PLATINUM in its composition.

Type Material: n.d.

References: (1) Cabri, L.J. and C.E. Feather (1975) Platinum–iron alloys: a nomenclature based on a study of natural and synthetic alloys. Can. Mineral., 13, 117–126. (2) (1976) Amer. Mineral., 61, 338–339 (abs. ref. 1). (3) Begizov, V.D., L.F. Borisenko, and Y.D. Uskov (1975) Sulfides and natural solid solutions of platinum metals from ultramafic rocks of the Gusevogorskii pluton, Urals. Doklady Acad. Nauk SSSR, 225, 1408–1411 (in Russian). (4) Cabri, L.J., Ed. (1981) Platinum group elements: mineralogy, geology, recovery. Can. Inst. Min. & Met., 113–114. (5) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 260.