Chengdeite Ir_3Fe

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. Subhedral granular aggregates, to 0.5 mm, and as graphic intergrowths with osmiridium.

Physical Properties: *Tenacity:* Malleable. Hardness = 5 VHN = 411–467, 452 average (50 g load). D(meas.) = n.d. D(calc.) = 19.19 Strongly magnetic.

Optical Properties: Opaque. *Color:* Steel-black; bright white with yellowish tint in reflected light. *Streak:* Black. *Luster:* Metallic.
Optical Class: Isotropic.
R: (400) 61.7, (420) 63.2, (440) 64.5, (460) 65.7, (480) 66.5, (500) 67.4, (520) 68.3, (540) 69.1, (560) 69.9, (580) 70.7, (600) 71.6, (620) 72.4, (640) 72.5, (660) 72.5, (680) 72.7, (700) 72.8

Cell Data: *Space Group:* $Pm3m$. a = 3.792(5) Z = 1

X-ray Powder Pattern: Near Gaotai village, China.
1.142 (100), 2.18 (80), 1.094 (80), 1.34 (70), 1.89 (60), 1.26 (20), 1.200 (15)

Chemistry:

	(1)	(2)
Os	0.06	
Ir	88.5	91.17
Pt	2.2	
Rh	0.19	
Pd	0.00	
Pb	0.00	
Ni	0.03	
Co	0.03	
Cu	0.83	
Fe	7.9	8.83
As	0.02	
Total	99.76	100.00

(1) Near Gaotai village, China; by electron microprobe, average of 13 analyses; corresponds to $(Ir_{2.93}Pt_{0.07}Rh_{0.01})_{\Sigma=3.01}(Fe_{0.90}Cu_{0.08})_{0.98}$. (2) Ir_3Fe.

Occurrence: In chromite ores in ultramafic rocks and in placer concentrates derived therefrom.

Association: Inaglyite, osmiridium, ferrian platinum, laurite, irarsite, isoferroplatinum, erlichmannite, gaotaiite, galena, gold, chromite, magnetite.

Distribution: From a branch of the Luanhe River, near Gaotai village, Chengde Co., about 200 km north-northeast of Beijing, Hebei Province, China [TL].

Name: For Chengde Co., China, in which it was found to occur.

Type Material: Geological Museum of China, Beijing, China.

References: (1) Yu Zuxian (1995) Chengdeite – ordered natural iron-iridium alloy. Acta Geol. Sinica, 69(3), 215–220 (in Chinese with English abs.). (2) (1996) Amer. Mineral., 81, 516–520 (abs. ref. 1).