Coulsonite $Fe^{2+}V_2^{3+}O_4$

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. As subhedral crystals, less than 1 mm; and as exsolution lamellae along {111} in magnetite.

Physical Properties: *Tenacity:* Brittle. Hardness = 4.5–5 D(meas.) = 5.17–5.20 D(calc.) = 5.15

Optical Properties: Opaque. *Color:* Bluish gray; light gray in reflected light. *Streak:* Dark brown to black. *Luster:* Metallic.
Optical Class: Isotropic; locally slightly anisotropic.
R: 23.5

Cell Data: *Space Group: Fd3m.* a = 8.297(2) Z = 8

X-ray Powder Pattern: Buena Vista Hills, Nevada, USA.
2.50 (100), 1.466 (95), 1.597 (91), 2.07 (78), 2.93 (58), 4.79 (35), 1.693 (28)

Chemistry:

	(1)	(2)	(3)
TiO_2		5.29	
Fe_2O_3	0.52		
V_2O_3	68.41	59.6	67.60
Cr_2O_3		0.12	
FeO	30.75	33.1	32.40
Total	99.68	98.1	100.00

(1) Buena Vista Hills, Nevada, USA; corresponds to $Fe^{2+}_{1.00}(V^{3+}_{1.07}Fe^{3+}_{0.01})_{\Sigma=1.08}O_{4.24}$.
(2) Kalgoorlie, Australia; by electron microprobe, average of three analyses; original analysis Fe 25.7%, Ti 3.17%, Cr 0.08%, V 40.5%, here converted to oxides; corresponding to $Fe^{2+}_{1.03}(V^{3+}_{1.84}Ti_{0.13})_{\Sigma=1.97}O_{4.02}$. (3) $Fe^{2+}V^{3+}_2O_4$.

Mineral Group: Spinel group.

Occurrence: In veinlets of magnetite, with silicate minerals, cutting metamorphosed andesite (Buena Vista Hills, Nevada, USA); exsolved from magnetite in a mantle xenolith in basalt (Panzhihua, China).

Association: Magnetite, scapolite, apatite, titanite, chlorite, "hornblende", muscovite (Buena Vista Hills, Nevada, USA).

Distribution: From the Buena Vista Hills, 32 km southeast of Lovelock, Mineral Basin district, Pershing Co., Nevada, USA. At Kalgoorlie, Western Australia. In India, at Dublahera, Singhbum, Bihar. Found at Panzhihua, Sichuan Province, China.

Name: For Dr. Arthur Lennox Coulson (1898–?), geologist of the Indian Geological Survey.

Type Material: n.d.

References: (1) Radtke, A.S. (1962) Coulsonite, FeV_2O_4, a spinel-type mineral from Lovelock, Nevada. Amer. Mineral., 47, 1284–1291. (2) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 702, 703 [coulsonite = vanadian magnetite]. (3) Spiridonov, E.M. (1979) Titanium coulsonite from the Kalgoorlie deposit, Australia. Doklady Acad. Nauk SSSR, 245, 447–449 (in Russian).