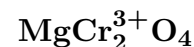


# Magnesiochromite



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**Crystal Data:** Cubic. *Point Group:*  $4/m\bar{3}2/m$ . Rarely as poorly formed octahedra, to 1.5 mm; commonly granular, massive. *Twinning:* On {111} as both twin and composition plane, the spinel law, as contact twins.

**Physical Properties:** *Cleavage:* Parting on {111}, possible. *Fracture:* Uneven. *Tenacity:* Brittle. Hardness = 5.5–7 D(meas.) = 4.39–4.67 D(calc.) = 4.414 Weakly magnetic.

**Optical Properties:** Opaque, transmits light through thin edges. *Color:* Black, deep red; gray in reflected light. *Streak:* Brown. *Luster:* Metallic.

*Optical Class:* Isotropic.  $n = 1.96$

**Cell Data:** *Space Group:*  $Fd\bar{3}m$  (synthetic).  $a = 8.3341(2)$   $Z = 8$

**X-ray Powder Pattern:** Synthetic.

2.512 (100), 4.813 (65), 2.083 (55), 1.4731 (55), 1.603 (40), 2.945 (14), 2.406 (14)

<b>Chemistry:</b>	(1)	(2)	(3)	(1)	(2)	(3)	
TiO <sub>2</sub>	0.17	0.11		FeO	11.90	13.77	
Al <sub>2</sub> O <sub>3</sub>	10.30	11.93		MnO		0.93	
V <sub>2</sub> O <sub>5</sub>	0.09			NiO	0.04		
Cr <sub>2</sub> O <sub>3</sub>	59.10	57.52	79.04	MgO	19.30	15.33	20.96
				Total	100.90	99.59	100.00

(1) Kalarangi mines, Orissa, India; by electron microprobe, total Fe as FeO; Fe<sup>2+</sup>:Fe<sup>3+</sup> recalculated for charge balance, then corresponding to (Mg<sub>0.88</sub>Fe<sub>0.12</sub>)<sub>Σ=1.00</sub>(Cr<sub>1.43</sub>Al<sub>0.37</sub>Fe<sub>0.19</sub>)<sub>Σ=1.99</sub>O<sub>4</sub>. (2) Leucite Hills, Wyoming, USA; by electron microprobe, total Fe as FeO. (3) MgCr<sub>2</sub>O<sub>4</sub>.

**Polymorphism & Series:** Forms two series, with chromite, and with spinel.

**Mineral Group:** Spinel group.

**Occurrence:** An accessory mineral in ultramafic rocks, as dunites, serpentinites, kimberlites, lamproites, and komatiites. More rarely as xenocrysts in lamprophyres and mid-ocean basalts. May be detrital.

**Association:** Olivine, augite, magnetite, plagioclase, pigeonite.

**Distribution:** Widespread. A few localities for analyzed material include: from near Tampadel and Groschau, Lower Silesia, Poland. From Dobříš, and at Hamry, near Křemže, Czech Republic. At Ferdinandovo, Bulgaria. On Mt. Djeti, Togo. From Dun Mountain, New Zealand. In the Sukinda ultramafics, between Kansa to Mauabil, Orissa, India. In Canada, on Scottie Creek, about 32 km north of Ashcroft, British Columbia; from Black Lake and in the Caribou pit, Coleraine township, Quebec. In the Line Pit, Lancaster Co., Pennsylvania; from the Leucite Hills, Sweetwater Co., Wyoming, USA.

**Name:** For a MAGNESIum-rich *chromite*.

**References:** (1) Palache, C., H. Berman, and C. Frondel (1944) Dana's system of mineralogy, (7th edition), v. I, 709–712. (2) Sahoo, R.K. and G. van der Kaaden (1976) Chemistry of the Sukinda chromites, Orissa, India and its petrogenetic significance. Neues Jahrb. Mineral., Monatsh., 484–494. (3) Kuehner, S.M., A.D. Edgar, and M. Arima (1981) Petrogenesis of the ultrapotassic rocks from the Leucite Hills, Wyoming. Amer. Mineral., 66, 663–677. (4) O'Neill, H.St.C. and W.A. Dollase (1994) Crystal structures and cation distributions in simple spinels from powder XRD structural refinements: MgCr<sub>2</sub>O<sub>4</sub>, ZnCr<sub>2</sub>O<sub>4</sub>, Fe<sub>3</sub>O<sub>4</sub> and the temperature dependence of the cation distribution in ZnAl<sub>2</sub>O<sub>4</sub>. Phys. Chem. Minerals, 20, 541–555. (5) Phillips, W.R. and D.T. Griffen (1981) Optical mineralogy, 36–37. (6) (1960) NBS Circ. 539, 9, 34.

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