

Crystal Data: Cubic. *Point Group:* $2/m\bar{3}$. Typically cubic, pyritohedral, octahedral, and combinations of these and other forms, to 25 cm or more. Striated conforming to pyritohedral symmetry; may be elongated to acicular. Commonly granular, globular, framboidal, stalactitic. *Twinning:* Twin axis [001] and twin plane {011}, penetration and contact twins.

Physical Properties: *Cleavage:* Indistinct on {001}; partings on {011} and {111}, indistinct. *Fracture:* Conchoidal to uneven. *Tenacity:* Brittle. Hardness = 6–6.5 VHN = 1505–1520 (100 g load). D(meas.) = 5.018 D(calc.) = 5.013 Paramagnetic; a semiconductor.

Optical Properties: Opaque. *Color:* Pale brass-yellow, tarnishes darker and iridescent; in polished section creamy white. *Streak:* Greenish black to brownish black. *Luster:* Metallic, splendent. *Anisotropism:* Rarely.
R: (400) 38.2, (420) 40.5, (440) 42.8, (460) 45.5, (480) 48.5, (500) 51.0, (520) 52.6, (540) 53.8, (560) 54.6, (580) 55.0, (600) 55.2, (620) 55.5, (640) 56.0, (660) 56.4, (680) 56.8, (700) 57.0

Cell Data: *Space Group:* $Pa\bar{3}$. $a = 5.4179(11)$ $Z = 4$

X-ray Powder Pattern: Synthetic.

1.6332 (100), 2.7088 (85), 2.4281 (65), 2.2118 (50), 1.9155 (40), 3.128 (35), 1.4479 (25)

Chemistry:	(1)	(2)	(3)	(4)
Fe	46.49	29.30	33.32	46.55
Ni		16.69	0.19	
Co		trace	13.90	
S	53.49	53.40	52.45	53.45
Total	99.98	99.39	99.86	100.00

(1) Elba, Italy; remainder 0.04% SiO₂. (2) Mill Close mine, Derbyshire, England.

(3) Gladhammar, Sweden. (4) FeS₂.

Polymorphism & Series: Dimorphous with marcasite; forms a series with cattierite.

Mineral Group: Pyrite group.

Occurrence: Formed under a wide variety of conditions. In hydrothermal veins as very large bodies, as magmatic segregations, as an accessory mineral in igneous rocks, in pegmatites; in contact metamorphic deposits, also in metamorphic rocks; as diagenetic replacements in sedimentary rocks.

Association: Pyrrhotite, marcasite, galena, sphalerite, arsenopyrite, chalcocopyrite, many other sulfides and sulfosalts, hematite, fluorite, quartz, barite, calcite.

Distribution: The most abundant and widespread sulfide. Only a few localities for large or fine crystals can be mentioned. From Rio Marina, on Elba, and at Traversella, Piedmont, Italy. From Ambasaguas and Navajun, Logroño Province, Spain, sculptural groups of crystals. At Aktchitao, Kazakhstan. In the USA, in the IbeX mine, Leadville, Lake Co., Colorado; in Illinois, as “suns” at Sparta, Randolph Co.; very large crystals from the Santo Niño mine, near Duquesne, Santa Cruz Co., Arizona. In Pennsylvania, at the French Creek mines, Chester Co., and in the Carleton talc mine, Chester, Windsor Co., Vermont. From Butte, Silver Bow Co., Montana; at the Spruce claim, King Co., Washington; as “bars” from the Buick mine, Bixby, Iron Co., Missouri. In Peru, from many districts, with exceptional crystals from the Quiruvilca mine, La Libertad, and Huanzala, Huanaco.

Name: From the Greek for *fire*, as sparks may be struck from it.

References: (1) Palache, C., H. Berman, and C. Frondel (1944) Dana’s system of mineralogy, (7th edition), v. I, 282–290. (2) Brostigen, G. and A. Kjekshus (1969) Redetermined crystal structure of FeS₂ (pyrite). Acta Chem. Scand., 23, 2186–2188. (3) Dódony, I., M. Pósfai, and P.R. Buseck (1996) Structural relationship between pyrite and marcasite. Amer. Mineral., 81, 119–125. (4) (1955) NBS Circ. 539, 5, 29.

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