

Crystal Data: Cubic. *Point Group:* $2/m\bar{3}$. As octahedra and cubes, to 1 cm, and massive.

Physical Properties: *Cleavage:* {001}. Hardness = ~ 3.5 VHN = 743–837 (100 g load).
D(meas.) = 4.45 D(calc.) = 4.47

Optical Properties: Opaque. *Color:* Black; pale violet-gray in reflected light.

Luster: Metallic to submetallic.

R: (400) 34.2, (420) 33.6, (440) 33.2, (460) 32.8, (480) 32.4, (500) 32.2, (520) 32.0, (540) 31.8, (560) 31.8, (580) 31.8, (600) 32.0, (620) 32.0, (640) 32.1, (660) 32.3, (680) 32.6, (700) 32.9

Cell Data: *Space Group:* $Pa\bar{3}$. $a = 5.66787(8)$ [=say if syn?;??5.670??Kasompi] $Z = 4$

X-ray Powder Pattern: Kasompi mine, Congo.

2.83 (100), 1.707 (80), 1.091 (60), 2.00 (50), 2.54 (40), 2.32 (40), 1.003 (40)

Chemistry:	(1)	(2)	(3)
Ni	41.24	47.9	47.79
Co	3.41	1.1	
Fe	2.20	2.6	
S	53.15	48.4	52.21
Total	100.00	100.0	100.00

(1) Kasompi mine, Congo; corresponding to $(\text{Ni}_{0.86}\text{Co}_{0.07}\text{Fe}_{0.05})_{\Sigma=0.98}\text{S}_{2.02}$. (2) Kalgoorlie, Australia; by electron microprobe, corresponding to $(\text{Ni}_{1.02}\text{Fe}_{0.06}\text{Co}_{0.02})_{\Sigma=1.10}\text{S}_{1.90}$. (3) NiS₂.

Polymorphism & Series: Forms a series with cattierite.

Mineral Group: Pyrite group.

Occurrence: Disseminated through dolostone (Kasompi mine, Congo); an alteration product of arsenic-deficient nickel-skutterudite (Germany).

Association: Arsenic-deficient nickel-skutterudite, pyrite, polydymite, uraninite.

Distribution: From the Kasompi mine, 70 km west-southwest of Kambove [TL], and at Shinkolobwe, Katanga Province, Congo (Shaba Province, Zaire). From Schneeberg, Saxony; Nentershausen, ??ck, and Iserlohn, ??ck, Germany. In the Providencia mine, near Villamanín, Cármenes district, León Province, Spain. From the Saint Marina deposit, Haskovo district, and at the Medet deposit, Panagyurishte district, Bulgaria. From the Agyatagsk mercury deposit, Kel'badzhar, Azerbaijan. At the Miliken (Sweetwater) mine, Reynolds Co., Missouri, and from the Orphan mine, in the Grand Canyon, Coconino Co., Arizona, USA. At the San Santiago mine, La Rioja Province, Argentina. Found near the Scotia nickel deposit, Kalgoorlie, Western Australia. At the Kosaka mine, Akita Prefecture, Japan.

Name: In honor of Johannes F. Vaes (1902–1978), mineralogist for the Union Minière du Haut Katanga.

Type Material: [Columbia University, New York, now at American Museum of Natural History, New York, New York, USA ?]

References: (1) Kerr, P.F. (1945) Cattierite and vaesite: new Co–Ni minerals from the Belgian Congo. *Amer. Mineral.*, 30, 483–497. (2) Ostwald, J. (1980) Notes on a Co–Ni disulphide and a Co–Ni–Fe thiospinel from the Kalgoorlie district, Western Australia. *Mineral. Mag.*, 43, 950–951. (3) Nowack, E., D. Schwarzenbach, and T. Hahn (1991) Charge densities in CoS₂ and NiS₂ (pyrite structure). *Acta Cryst.*, 650–659. [in cattierite??should be??ck cell and syn??] (4) Berry, L.G. and R.M. Thompson (1962) X-ray powder data for the ore minerals. *Geol. Soc. Amer. Mem.* 85, 93–94. (5) Ramdohr, P. (1969) *The ore minerals and their intergrowths*, (3rd edition), 815–816. (6) Criddle, A.J. and C.J. Stanley, Eds. (1993) *Quantitative data file for ore minerals*, 3rd ed. Chapman & Hall, London, 599.

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