Djerfisherite $K_6(Fe,Cu,Ni)_{25}S_{26}Cl$

Crystal Data: Cubic. *Point Group:* $4/m\ \overline{3}\ 2/m$. As rounded grains, to 0.4 mm in diameter.

Physical Properties: Hardness = < 3.5 VHN = 172 D(meas.) = n.d. D(calc.) = n.d.

Optical Properties: Opaque. *Color:* Greenish yellow, close to khaki, to olive-drab.
Luster: Submetallic.
R: (400) 17.5, (420) 18.3, (440) 19.1, (460) 20.0, (480) 20.8, (500) 21.6, (520) 22.3, (540) 22.9, (560) 23.5, (580) 24.0, (600) 24.5, (620) 24.9, (640) 25.2, (660) 25.5, (680) 25.8, (700) 25.9

Cell Data: *Space Group:* $Pm3m$. $a = 10.465(1)$ $Z = 2$

X-ray Powder Pattern: Kota Kota meteorite.
1.828 (100), 2.985 (70), 2.372 (60), 10.34 (50), 5.97 (50), 3.118 (50), 3.269 (40)

Chemistry:

	(1)	(2)
K	8.7	9.00
Na	0.3	0.76
Fe	50.7	45.4
Cu	4.2	8.37
Ni	0.8	1.41
Mg		< 0.05
S	33.8	33.8
Cl	1.0	1.26
Total	99.5	100.00

(1) St. Marks meteorite; by electron microprobe, average of 12 grains; corresponds to $(K_{5.49}Na_{0.32})_{\Sigma=5.81}(Fe_{22.39}Cu_{1.63}Ni_{0.34})_{\Sigma=24.36}S_{26.00}Cl_{0.70}$. (2) Coyote Peak, California, USA; by electron microprobe, corresponds to $(K_{5.68}Na_{0.82})_{\Sigma=6.50}(Fe_{20.05}Cu_{3.25}Ni_{0.59})_{\Sigma=23.89}S_{26.00}Cl_{0.88}$.

Occurrence: In meteorites, in hydrothermal Cu–Ni sulfide ores, in skarns, in pegmatites, in kimberlites, and alkalic mafics.

Association: "Nickel-iron" (kamacite), troilite, schreibersite, clinoenstatite, tridymite, cristobalite, daubréelite, graphite, roedderite, alabandite (Kota Kota meteorite); talnakhite, pentlandite, chalcopyrite, magnetite, valleriite, sphalerite, platinum minerals (Talnakh area, Russia).

Distribution: Found in the Kota Kota [TL] and St. Marks [TL] enstatite chondrites, the Pena Blañca Spring [ck Springs??] achondrite, also the Toluca and Cape York octahedrite iron meteorites. In the USA, at Coyote Peak, near Orick, Humboldt Co., California. In Russia, in the Talnakh area, Noril'sk region, western Siberia; Udachnaya and other kimberlite pipes, Sakhan; the Inagli complex, Aldan Shield; the Lovozero, Khibiny, and Kovdor massifs, and the Salmagorskii ring igneous complex, Kola Peninsula. On Dupezeh Mountain, near Hero Town, Qala-Dizeh region, northeastern Iraq. From the Ilímaussaq intrusion, southern Greenland. At Kushiro, Hiroshima Prefecture, Japan.

Name: To honor Professor Daniel Jerome Fisher (1896–1988), American mineralogist, University of Chicago, Chicago, USA.

Type Material: n.d. [??where are Kota Kota and St. Marks meteorites??]

References: (1) Fuchs, L.H. (1966) Djerfisherite, alkali copper–iron sulfide: a new mineral from enstatite chondrites. Science, 153, 166–167. (2) (1966) Amer. Mineral., 51, 1815 (abs. ref. 1). (3) Dmitrieva, M.T., V.V. Ilyukhin, and G.B. Bokii (1979) Close packing and cation arrangement in the jerfisherite [*sic*] structure. Kristallografiya (Sov. Phys. Crystal.), 24, 1193–1197 (in Russian). (4) Clarke, D.B., R.H. Mitchell, C.A.T. Chapman, and R.M. MacKay (1994) Occurrence and origin of djerfisherite from the Elwin Bay kimberlite, Somerset Island, Northwest territories. Can. Mineral., 32, 815–823.