

Hemusite



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Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$, 432, or $\bar{4}3m$. As rounded grains and aggregates of irregular shape, to 0.05 mm.

Physical Properties: Hardness = ~ 4 VHN = 145; 210–215 D(meas.) = n.d.
D(calc.) = 4.469–4.55

Optical Properties: Opaque. *Color:* Gray; in polished section, violet-gray to ash-gray.
R: (400) 22.9, (420) 23.1, (440) 23.5, (460) 24.3 (480) 24.9, (500) 25.6, (520) 26.0, (540) 26.2, (560) 26.2, (580) 26.2, (600) 26.3, (620) 26.5, (640) 26.8, (660) 27.0, (680) 27.0, (700) 26.9

Cell Data: *Space Group:* $Fm\bar{3}m$, $F432$, or $F\bar{4}3m$. $a = 10.80$ – 10.83 $Z = 4$

X-ray Powder Pattern: Chelopech, Bulgaria.
3.11 (10), 1.919 (5), 1.858 (3), 1.632 (3) 3.61 (2), 2.87 (2), 2.55 (2)

Chemistry:	(1)	(2)	(3)
Cu	43.6	43.80	44.73
Sn	12.8	12.09	13.92
Fe	2.6	0.60	
Mn		0.08	
Zn		0.08	
Cd		0.04	
Mo	11.7	10.38	11.26
Ag		0.06	
As	0.1		
Bi		1.42	
Se		1.06	
Te		0.50	
S	28.0	29.82	30.09
Total	98.8	99.88	100.00

(1) Chelopech, Bulgaria; by electron microprobe, corresponds to $\text{Cu}_{5.98}\text{Sn}_{0.94}\text{Fe}_{0.40}\text{As}_{0.01}\text{Mo}_{1.06}\text{S}_{7.61}$. (2) Kawazu mine, Japan; by electron microprobe, corresponds to $(\text{Cu}_{5.91}\text{Fe}_{0.09}\text{Zn}_{0.01}\text{Ag}_{0.01})_{\Sigma=6.02}(\text{Sn}_{0.87}\text{Bi}_{0.06}\text{Te}_{0.03})_{\Sigma=0.96}\text{Mo}_{0.93}(\text{S}_{7.97}\text{Se}_{0.12})_{\Sigma=8.09}$. (3) $\text{Cu}_4^{1+}\text{Cu}_2^{2+}\text{SnMoS}_8$.

Occurrence: Of hydrothermal origin, early formed in the mineral association (Chelopech, Bulgaria); in a polymetallic deposit in carboniferous porphyritic andesites (Kochbulak deposit, Uzbekistan).

Association: Enargite, luzonite, colusite, stannoidite, reniérite, tennantite, chalcopyrite, pyrite (Chelopech, Bulgaria).

Distribution: At the Chelopech deposit, Sofia, Bulgaria [TL]. From the Kochbulak gold deposit, Chatkal-Kuramin Mountains, eastern Uzbekistan. In Japan, in the Kawazu mine, Shizuoka Prefecture, and at the Iriki mine, Kagoshima Prefecture.

Name: After an ancient name for the Balkan Mountains, on the southern slope of which the Chelopech deposit occurs; probably of Thracian origin.

Type Material: University of Sofia, Sofia; Geological Institute, Bulgarian Academy of Sciences, Sofia, Bulgaria.

References: (1) Terziev, G.I. (1971) Hemusite – a complex copper-tin-molybdenum sulfide from the Chelopech ore deposit, Bulgaria. *Amer. Mineral.*, 56, 1847–1854. (2) Shimizu, M., A. Kato, and S. Matsubara (1988) Hemusite and paraguanajuatite from the Kawazu mine, Shizuoka Prefecture, Japan. *Mineral. J. (Japan)*, 13, 92–100. (3) Shimizu, M., C.J. Stanley, A.J. Criddle, A. Kato, and S. Matsubara (1991) New compositional and optical data for antimonian and bismuthian varieties of hemusite from Japan. *Mineral. Petrol.*, 45, 11–17.

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