

Galkhaite**(Cs, Tl)(Hg, Cu, Zn)₆(As, Sb)₄S₁₂**

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Crystal Data: Cubic. *Point Group:* $\bar{4}3m$. As cubic crystals, to 1.2 cm, and granular aggregates.

Physical Properties: *Fracture:* Uneven to fine conchoidal. *Tenacity:* Brittle. Hardness = 3 VHN = 186–202 (100 g load). D(meas.) = 5.4 D(calc.) = 5.44

Optical Properties: Opaque. *Color:* Dark red-orange. *Streak:* Yellow-orange. *Luster:* Vitreous to adamantine.

R: (400) 30.5, (420) 29.7, (440) 29.3, (460) 28.8, (480) 28.0, (500) 26.8, (520) 26.6, (540) 24.6, (560) 23.8, (580) 23.1, (600) 22.6, (620) 22.2, (640) 21.9, (660) 21.6, (680) 21.4, (700) 21.2

Cell Data: *Space Group:* $I\bar{4}3m$. $a = 10.365(3)$ $Z = 12$

X-ray Powder Pattern: Gal-Khaya, Russia.
3.01 (100), 2.78 (80), 4.27 (70), 7.40 (50), 1.841 (50), 2.604 (29), 1.569 (29)

Chemistry:

| | (1) | (2) |
|-------|-------|-------|
| Hg | 51.7 | 50.7 |
| Cu | 3.4 | 3.2 |
| Zn | 1.6 | 1.8 |
| Cs | 3.3 | 5.1 |
| Tl | 0.8 | 2.4 |
| As | 14.5 | 15.2 |
| Sb | 3.0 | 0.3 |
| S | 22.3 | 22.0 |
| Total | 100.6 | 100.7 |

(1) Khaydarkan, Kyrgyzstan; by electron microprobe, corresponds to $(Cs_{0.43}Tl_{0.07})_{\Sigma=0.50}(Hg_{4.45}Cu_{0.92}Zn_{0.42})_{\Sigma=5.77}(As_{3.34}Sb_{0.42})_{\Sigma=3.76}S_{12.00}$. (2) Getchell mine, Nevada, USA; by electron microprobe, corresponds to $(Cs_{0.67}Tl_{0.21})_{\Sigma=0.88}(Hg_{4.42}Cu_{0.88}Zn_{0.48})_{\Sigma=5.78}(As_{3.55}Sb_{0.04})_{\Sigma=3.59}S_{12.00}$.

Occurrence: In hydrothermal Hg–Au deposits.

Association: Pyrite, stibnite, cinnabar, metacinnabar, aktashite, enargite, wakabayashilite, orpiment, realgar, getchellite, calcite, fluorite, quartz (Russia); pyrite, realgar, stibnite, orpiment, getchellite, fluorite, quartz (Getchell mine, Nevada, USA).

Distribution: From the Gal-Khaya mercury deposit, Sakha, Russia [TL]. In Kyrgyzstan, at Khaydarkan [TL] and in the Chauvai Sb–Hg deposit, both in the Fergana Valley, Alai Range. In the USA, in Nevada, large crystals from the Getchell mine, Potosi district, Humboldt Co.; at the Carlin mine, 50 km northwest of Elko, and the Goldstrike and Rodeo mines, Lynn district, Eureka Co.; in the Jerritt Canyon mine, Independence Mountains district, Elko Co. From the Hemlo gold deposit, Thunder Bay district, Ontario, Canada.

Name: For the Gal-Khaya deposit, Russia.

Type Material: Mining Institute, St. Petersburg, 1052/1–2; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 73879, 73880.

References: (1) Gruzdev, V.S., V.I. Stepanov, N.G. Shumkova, N.M. Chernitsova, R.N. Yudin, and I.A. Bryzgalov (1972) Galkhaite $HgAsS_2$ – a new mineral from arsenic–antimony–mercury deposits of the U.S.S.R. *Doklady Acad. Nauk SSSR*, 205, 1194–1197 (in Russian). (2) (1974) *Amer. Mineral.*, 59, 208–209 (abs. ref. 1). (3) Chen, T.T. and J.T. Szymański (1981) The structure and chemistry of galkhaite, a mercury sulfosalt containing Cs and Tl. *Can. Mineral.*, 19, 571–581. (4) Chen, T.T. and J.T. Szymański (1982) A comparison of galkhaite from Nevada and from the type locality, Khaydarkan, Kirgizia [Kyrgyzstan], U.S.S.R. *Can. Mineral.*, 20, 575–577. (5) Criddle, A.J. and C.J. Stanley, Eds. (1993) Quantitative data file for ore minerals, 3rd ed. Chapman & Hall, London, 187.

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