# Maikainite

$Cu_{20}(Fe,Cu)_6Mo_2Ge_6S_{32}$

CUBIC

**Locality**: (1) Maikain deposit, Kazakhstan and (2) Tsumeb deposit, Namibia.

**Occurrence**: (1) In a gold-bearing massive-sulfide base-metal deposit. Associated minerals are: germanite, ovamboite, germanocolusite, sphalerite, bornite, tennantite, gallite, galena and barite. (2) In a germanium-bearing massive-sulfide base-metal deposit. Associated minerals are: ovamboite, germanite and germanocolusite.

**General appearance**: (1) Tiny (up to 45 μm) oval particles and rare crystals {111} and {110}. (2) Round segregations usually 3 to 40 μm across, but up to 150 μm.

**Physical, chemical and crystallographic properties**: *Luster*: metallic. *Diaphaneity*: opaque. *Color*: megascopic color not given. *Streak*: not given. *Hardness*: $VHN_{30}$ 275 to 345 (average 305) kg/mm$^2$. *Tenacity*: not given. *Cleavage*: absent. *Fracture*: not given. *Density*: could not be measured, 4.54 g/cm$^3$ (calc.). **Crystallography**: Cubic, $P\bar{4}3n$ by analogy with the germanite group, $a$ 10.64 Å, $V$ 1205 Å$^3$, $Z$ = 1. Morphology: {111} and {110}. Twinning: none mentioned. **X-ray powder-diffraction data**: 3.07(10)(222), 2.66(2)(400), 1.884(8)(440), 1.603(4)(622), 1.331(1)(800), 1.220(2)(662), 1.190(1)(840). **Optical data**: In reflected light: bright yellow to grayish yellow, isotropic, no internal reflections. R: (23.7%) 470 nm, (25.5%) 546 nm, (25.7%) 589 nm, (25.6%) 650 nm. **Chemical analytical data**: Three sets of electron-microprobe data are given. The data corresponding to the material used to derive the unit-cell parameter are: Cu 42.55, Zn 0.56, Fe 6.35, As 2.28, Mo 5.21, W 1.24, S 31.40, V 0.12, Ge 10.86, Ga 0.15, Total 100.72 wt.%. Empirical formula: $(Cu_{21.91}Fe_{3.72}Zn_{0.28})_{\Sigma 25.91}(Mo_{1.78}W_{0.22}V_{0.08})_{\Sigma 2.08}(Ge_{4.90}As_{1.00}Ga_{0.07})_{\Sigma 5.97}S_{32.04}$. **Relationship to other species**: A member of the germanite group.

**Name**: Reflects the type locality.

**Comments**: IMA No. 1992–038.

SPIRIDONOV, E.M. (2003): Maikainite $Cu_{20}(Fe,Cu)_6Mo_2Ge_6S_{32}$ and ovamboite $Cu_{20}(Fe,Cu,Zn)_6W_2Ge_6S_{32}$: new minerals in massive sulfide base metal ores. *Doklady Earth Sciences* **393A**, 1329-1332.