Pararsenolamrite, a new polymorph of native As, from Au-Ag-Sb-As epithermal vein-type deposits of the Mukuno mine, Kyushu, Japan.

Shimizu, M. (Dept. of Earth Sci., Toyama Univ., Japan), Matsubara, S., Miyawaki, R. (National Sci. Museum, Japan) & Yamanaka, T.

Pararsenolamrite, the third polymorph of native arsenic, was discovered from Au-Ag-Sb-As epithermal quartz veins of the Mukuno mine, Oita Prefecture, Japan. It is orthorhombic, $Pmn2_1$ or $P2_1nm$, and cell parameters are: a=3.633(2), b=10.196(2), c=10.314(2) Å, Z=18. The seven strongest lines (d-spacing nm; relative intensity; hkl indices) in the X-ray powder diffraction pattern are: 5.17; 100; 002, 4.60; 24; 012, 3.259; 58; 013, 2.840; 27; 032, 2.580; 22; 004, 2.299; 23; 024, and 1.794; 26; 105. Electron-microprobe analysis gives As 91.89, Sb 7.25, S 0.48, total 99.62 wt.% (mean of 8), and lead to the empirical formula, $As_{0.96}Sb_{0.03}S_{0.01}$. The Sb content is considerably higher than the associated arsenic whose Sb content is approximately 2.5 wt.%. It is lead grey in colour and opaque with metallic lustre and black streak. It is sectile and brittle with perfect cleavage on {001}. The VHN_{25} is 66-91 kg/mm^2, corresponding to 2-2.5 in Mohs' hardness scale. The measured and calculated densities are 5.88(5) g/cm^3 and 6.01 g/cm^3, respectively, and the highest among the three arsenic minerals. Pararsenolamprite is more resistible for alteration by weathering or oxidation than arsenis. These characters suggest stronger bonding between arsenic atoms in the crystal structure. In reflected plane-polarized light in air, it is white with a slightly greenish blue tint. Anisotoropy is strong, dark brown to dark greenish grey. Bireflectance is distinct; parallel to elongation it is creamy; perpendicular to elongation it is brown, grey and green. Internal reflections are absent. The reflectance spectra in air are; 49.0, 44.0 (470 nm); 47.0, 42.1 (546 nm); 44.8, 39.9 (589 nm); 44.9, 40.3 (650 nm).

Pararsenolamprite occurs as euhedral crystals in close association with arsenic, stibnite and quartz in Au-Ag-Sb-As-bearing quartz veins cutting altered Neogene andesite at the Mukuno mine. It forms radial or parallel aggregates of bladed crystals up to 0.8 mm in length.

Although pararsenolamprite has not synthesized from pure As, its stability should need more Sb in the crystal structure than the two other arsenic minerals. It is surprised that such a simple elemental mineral has never been found until the beginning of the 21st Century. It suggests that we must research besic substance in nature more carefully.