

Palladseite, a new mineral from Itabira, Minas Gerais, Brazil

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PALLADSEITE, Pd₁₇Se₁₅, a new selenide of palladium, occurs sparingly in the residual concentrates from the gold washing at Itabira, Minas Gerais, Brazil, associated with arsenopalladinite, isomertieite, and atheneite (Clark *et al.*, 1974). Individual grains are up to 0.5 mm in size. The name, given for the chemical composition, and the mineral data have been approved by the Commission on New Minerals and Mineral Names, IMA. The full report includes data on five grains of palladseite separated from the concentrates, and compares the mineral's properties with those of the previously established synthetic phase (Geller, 1962). Here we report the results of the electron probe, X-ray, and optical investigation of one essentially typical grain of palladseite.

Electron probe analysis gave Pd 55.77, Cu 3.99, Hg 1.66, Se 38.59, total 100.01%. Based on 32 atoms per formula unit the analysis recalculates to (Pd_{15.47}Cu_{1.85}Hg_{0.24})_{Σ = 17.56}Se_{14.43}. Copper and mercury are regarded as non-essential constituents.

X-ray studies show palladseite to be primitive cubic without systematic absences, a 10.635 Å, D_{calc} 8.15. The strongest lines of the powder pattern, obtained using a Gandolfi camera, are (d in Å, visual I , $N = h^2 + k^2 + l^2$) 2.832 vs 14, 2.571 s 67, 2.430 s 72, 2.040 s 82, 1.887 vs 84, 1.723 s 93. According to Geller (1962) synthetic Pd₁₇Se₁₅ is cubic, space group $Pm\bar{3}m$, a 10.606 Å, $Z = 2$, D_{meas} 8.30, D_{calc} 8.33.

In reflected light, palladseite is isotropic. It is white in air and in plane polarized light, and a very light grey in oil. R values were measured at 20 nm intervals from 400 nm to 700 nm in air and in oil. At the four COM recommended wavelengths its reflectance values in air and in Cargille oil, type A.D., are: 470 nm, 43.1 and 28.9; 546 nm, 44.9 and 30.1; 589 nm, 45.1 and 30.1; 650 nm, 45.0 and 30.1. Quantitative Colour Values derived from the spectral dispersion curves of reflectance, and calculated to the CIE illuminant C (6750 °K) are, for the rectangular chromaticity coordinates x and y , 0.3132 and 0.3213 in air, 0.3129 and 0.3216 in oil. The Helmholtz values, dominant wavelength λ_D and excitation purity P_e %, are the same in air and oil, 570 nm and 2 % respectively; Y , the luminance differs; in air it is 44.92 and in oil 30.10. The VHN at one Newton is 414, range 390–437.

Cubic palladseite, being isotropic, can be readily distinguished from the only other known selenide of palladium, orthorhombic oosterboschite (Pd, Cu)₇Se₅, (Johan *et al.*, 1970).

REFERENCES

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