## Chernovite-(Y) $YAsO_4$



**Crystal Data:** Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Crystals prismatic to pseudo-octahedral, to 5 mm, with {010}, {011}, {001}, rare {110}.

**Physical Properties:** *Cleavage:* On {010}, perfect; may glide on {001} or {110}. *Tenacity:* Brittle. Hardness = 4.5 VHN = 229–429, average 313. D(meas.) = n.d. D(calc.) = 4.866

**Optical Properties:** Semitransparent. *Color:* Colorless, pale yellow, lemon-yellow, greenish yellow, bright green; may be zoned. *Luster:* Vitreous.
*Optical Class:* Uniaxial (+). *Pleochroism:* $O$ = pale rose-yellow; $E$ = colorless. $\omega = 1.783(1)$ $\epsilon = 1.879(2)$

**Cell Data:** *Space Group:* $I4_1/amd$. $a = 6.99$–$7.09$ $c = 6.17$–$6.32$ Z = 4

**X-ray Powder Pattern:** Synthetic.
3.52 (100), 2.661 (75), 1.817 (65), 2.490 (18), 1.760 (16), 1.468 (16), 1.1272 (16)

**Chemistry:**

| | (2) | (3) |
|---|---|---|
| $P_2O_5$ | 5.5 | 17.24 |
| $As_2O_5$ | 40.3 | 27.91 |
| $Y_2O_3$ | 36.9 | 54.85 |
| $La_2O_3$ | 15.1 | |
| Total | 97.8 | 100.00 |

(1) Nyarta-Syu-Yu River, Russia; spectrographic analyses gives Y ≫30%, As ∼30%, La 0.8%, Ce 0.8%, P 0.6%, V 0.3%, Si 2.0%, Ti 0.04%, Mn 0.02%, Pb 0.01%, Cu 0.01%, Cr 0.01%, Sn 0.01%, Be 0.001%; ΣRE = Y 78%, Ce 0.4%, Nd 1.6%, Sm 1.1%, Eu 0.2%, Gd 2.2%, Tb 0.6%, Dy 4.2%, Ho 1.4%, Er 4.7%, Tm 0.6%, Yb 4.1%, Lu 0.9%. (2) Wannigletscher, Binntal, Switzerland; by electron microprobe. (3) $Y(As,P)O_4$ with As:P = 1:1.

**Polymorphism & Series:** Forms a series with xenotime-(Y).

**Occurrence:** In piemontite veinlets in liparite porphyry (Nyarta-Syu-Yu River, Russia); in Alpine-type fissures (Binntal, Switzerland).

**Association:** Piemontite, molybdenian scheelite, albite, calcite, garnet, hastingsite, pyrolusite, hematite (Nyarta-Syu-Yu River, Russia); niobian rutile, magnetite, asbecasite, cafarsite (Binntal, Switzerland).

**Distribution:** Near the head of the Nyarta-Syu-Yu River, east of Mt. Tel'posiz, Polar Ural Mountains, Russia. On the west flank of Cherbadung [Pizzo Cervandone], Binntal, Valais, Switzerland. On the east flank of Pizzo Cervandone, Alpe Devero, Val d'Aosta, Piedmont, Italy. At Sailauf, northeast of Aschaffenburg, Bavaria, Germany. In the USA, at the Squaw Creek tin prospect and Paramount Canyon, Taylor Creek district, Sierra Co., New Mexico. Large crystals from Brumado, Bahia, also at the José Pinto pegmatite, at Jaguaraçú, near Coronel Fabriciano, Minas Gerais, Brazil.

**Name:** Honoring Professor Aleksandr Aleksandrovich Chernov (1877–1963), Russian geologist, Institute of Geology, Syktyvar, Russia, explorer of the Polar Urals.

**Type Material:** Mining Museum, St. Petersburg, Russia, 1013/1.

**References:** (1) Goldin, B.A., N.P. Yushkin, and M.V. Fishmin (1967) A new yttrium mineral, chernovite. Zap. Vses. Mineral. Obshch., 96, 699–704 (in Russian). (2) (1968) Amer. Mineral., 53, 1777 (abs. ref. 1). (3) Graeser, S., H. Schwander, and H.A. Stalder (1973) A solid solution series between xenotime ($YtPO_4$) and chernovite ($YtAsO_4$). Mineral. Mag., 39, 145–151. (4) Graeser, S. and A.G. Roggiani (1976) Occurrence and genesis of rare arsenate and phosphate minerals around Pizzo Cervandone, Italy/Switzerland. Rend. Soc. Ital. Mineral. Petrol., 32, 279–288. (5) (1963) NBS Mono. 25, 2, 39.