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New Mineral Names

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ABSTRACT

This issue of New Mineral Names provides a summary of the newly described minerals from May to August 2024, including karlseifertite, vegrandisite, touretite, auropolybasite, cuprozheshengite, calcioveatchite, and jianmuite.

RECENTLY APPROVED

This section features just a few of the 29 minerals approved by the IMA-CNMNC from May to August 2024; see Table 1 for the complete list and brief details of all 29 minerals (Bosi et al. 2024a, 2024b).

Karlseifertite, $Pb(Ga_2Ge)(AsO_4)_2(OH)_6$

Karlseifertite (IMA 2024-007) is a new alunite supergroup mineral from the Tsumeb mine, Namibia with the ideal formula $Pb(Ga_2Ge)(AsO_4)_2(OH)_6$. Karlseifertite currently represents a unique combination of elements and is the only mineral with essential Pb, Ge, and As. The new mineral is chemically and structurally related to gallobeudantite, $PbGa_3(AsO_4)(SO_4)(OH)_6$, another alunite supergroup member that was also first discovered at the Tsumeb mine. The Tsumeb mine is notably diverse in Ge, Ga, and As minerals. According to www.mindat.org, Tsumeb is the type locality for 6 of the 7 Ga minerals, 15 of the 22 Ge minerals, and 46 of the 111 As species reported from there. Tsumeb is an unusual site in that Ge forms a primary sulfide phase, germanite ($Cu_{13}Fe_2Ge_2S_{16}$), first discovered at the Tsumeb mine and published in 1922 (Pufahl 1922). Although Ga is about as abundant as Y or Nb in Earth's crust (Fleischer 1953), it only rarely forms distinct minerals and is typically found in low concentrations in sulfide minerals such as sphalerite. Gallite is the most widespread Ga mineral, with a total of nine reported localities, according to www.mindat.org. Of the remaining Ga minerals, five are reported from one locality (four of these being from Tsumeb). In contrast, zincobriartite, the second most widespread Ga mineral, is reported from only three localities. Of the eight valid minerals with essential Ga, only richardsite and zincobriartite were not first discovered at Tsumeb. Note that zincobriartite, but not richardsite, has since been located at Tsumeb. Due to the very uncommon elemental enrichment required to form karlseifertite, this mineral is expected to be extremely rare worldwide and may be endemic to Tsumeb. Karlseifertite is trigonal, $R\bar{3}m$ with $a = 7.2814(7)$, $c = 17.108(1)$ Å. Two type specimens are stored in the collections of the Natural History Museum of Los Angeles County with catalog numbers 76334 and 76335.

Vegrandisite, $BaCl_2$

Vegrandisite (IMA 2023-045a), ideally $BaCl_2$, is a new mineral discovered at the Biely Vrch deposit in the Banská Bystrica Region of Slovakia. The new mineral has long been known among chemists as a simple Ba salt. Vegrandisite would be expected to be scarce in natural systems due to its high solubility ($BaCl_2$ has a solubility of ca. 31.2 g/100 mL H_2O, whereas NaCl has a solubility of ca. 36 g/100 mL). Furthermore, systems with highly soluble salts (e.g., evaporite basins) are also commonly enriched in sulfate. In the presence of sulfate, Ba is typically immobilized as the highly insoluble mineral baryte. Although vegrandisite was only recently described, $BaCl_2$ daughter crystals in fluid inclusions have been known for decades (e.g., Huichu et al. 1991). Vegrandisite was discovered in a quartz vein at the Biely Vrch porphyry gold deposit in Slovakia. Biely Vrch is an unusual site in that it represents an essentially end-member Au porphyry system exhibiting no Cu, Mo, or sulfide mineralization. Koděra et al. (2014) collected fluid inclusion data and interpreted that the porphyry mineralization resulted from a magmatic Fe-K-Na-Cl salt vapor with ca. 10 ppm Au. The anhydrous nature of the ore mineralization facilitated the formation of soluble and/or hygroscopic minerals such as vegrandisite, as well as javorieite ($KFeCl_3$), another species recently discovered at the Biely Vrch deposit. Vegrandisite is orthorhombic, *Pnma*, with cell parameters $a = 7.80(3)$, $b = 4.71(2)$, $c = 9.60(9)$ Å. One type specimen is deposited in the collections of the Mineralogical Museum at Comenius University in Bratislava, Slovakia.

Touretite, $LiAl_4Be_4(B_{11}Be)O_{28}$

Touretite (IMA 2023-003a), ideally $LiAl_4Be_4(B_{11}Be)O_{28}$, is the new Li analogue of londonite (Cs-dominant) and rhodizite (K-dominant) from the Ambalabe pegmatite in the Betafo district of central Madagascar. Touretite is the first mineral with essential Li, Be, and B. Like other members of the londonite-rhodizite series, touretite is isometric with $P\bar{4}3m$ symmetry and $a = 7.3120(1)$ Å. Bearing a third member, the minerals should be considered to form the "rhodizite group." Interestingly, early analyses made on londonite-rhodizite samples gave high Li and even suggested Li was species-defining (Pekov et al. 2010 in discussion of Lacroix 1910 and Duparc et al. 1911). Compared to londonite, with $a = 7.3098(2)$ Å, and rhodizite, with $a = 7.318(1)$ Å, the cell of touretite is closer to that of rhodizite (Pring et al. 1986; Gatta et al. 2010), suggesting a unique interplay on the substitution of small and large cations. Madagascar so far hosts the only known localities that produced large gem-quality crystals of londonite-rhodizite (Laurs et al. 2002; Pezzotta 2008), all specimens having been recovered from a shallow and narrow (10–60 cm) but long (400 m) pegmatite dike (Demartin et al. 2001). One type specimen is stored in the collections of the Loboratoire de Minéralogie at the University of Liege in Belgium with catalog number M39042.

Auropolybasite, $[Ag_9AuS_4][Ag_6Sb_2S_7]$

Auropolybasite ($[Ag_9AuS_4][Ag_6Sb_2S_7]$; IMA2024-006) is a new pearceite-polybasite group mineral described from the Šibeničný vrch deposit in the Banská Bystrica Region, Slovakia. Auropolybasite is trigonal, $P3_221$ and $a = 15.1091(5)$ and $c = 12.1518(5)$ Å. Auropolybasite is the Au analogue of polybasite ($[Ag_9CuS_4][Ag_6Sb_2S_7]$) and argentopolybasite ($[Ag_9AgS_4][Ag_6Sb_2S_7]$). The new mineral is the first member of the pearceite-polybasite group with essential Au. The

* All minerals have been approved by the IMA CNMMC. For a complete listing of all IMA-validated unnamed minerals and their codes, see http://cnmnc.units.it/ (click "IMA list of minerals").

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Table 1. New minerals approved by the IMA-CNMNC from May–August 2024[a]

Mineral	Formula	IMA #	Space Group	Type Locality Area	Country	New RN
Oboniobite[b]	$Mg_4Nb_2O_9$	2023-118a	$P\bar{3}c1$	Bayan Obo	China	yes
Parisite-(Nd)	$CaNd_2(CO_3)_3F_2$	2024-013	*Cc*	Bayan Obo	China	no
Scandio-fluoro-eckermannite[b]	$NaNa_2(Mg_4Sc)(Si_8O_{22})F_2$	2024-002	*C*2/*m*	Bayan Obo	China	no
Juxingite	$Bi_6Cu_{140}Fe_{30}S_{125}$	2024-011	$F\bar{4}3m$	Jiama deposit	China	yes
Ohtaniite[b]	$Mg_3(Si_{0.5}\square_{0.5})Si_2O_8$	2024-012	*Imma*	Suizhou meteorite	China	yes
Berndlehmannite	$Cu(CrV)S_4$	2024-005	$Fd\bar{3}m$	Zhongcun deposit	China	yes
Annivite-(Zn)	$Cu_6(Cu_4Zn_2)Bi_4S_{13}$	2023-124	$I\bar{4}3m$	Eliáš Mine	Czech Rep.	yes
Markwelchite[b]	$TlPbSbS_3$	2024-001	$P2_1/c$	Jas Roux deposit	France	yes
Steiningerite	$Ba_2Zr_2(Si_4O_{12})O_2$	2024-016	*P*4/*mbm*	Löhley basalt quarry	Germany	yes
Krügerite	$BaCa_6(SiO_4)_2[(P_{0.5}S_{0.5})O_4]_2F$	2023-121	$R\bar{3}m$	Hartrurim Complex	Israel	yes
Manganonewberyite	$Mn(PO_3OH)(H_2O)_3$	2024-004	*Pbca*	Cassagna Mine	Italy	no
Dacostaite	$K(Mg_2Al)[Mg(H_2O)_6]_2(AsO_4)_2F_6{\cdot}2H_2O$	2024-015	*C*2/*m*	Cetine de Cotorniano Mine	Italy	yes
Nannoniite	$Al_2(OH)_5F$	2024-010	$P2_1/n$	Cetine de Cotorniano Mine	Italy	yes
Miyawakiite-(Y)	$\square Y_4Fe_2(Si_8O_{20})(CO_3)_4(H_2O)_3$	2024-003	*I*4/*mcm*	Suishoyama	Japan	yes
Calciopharmacoaluminite	$Ca_{0.5}Al_4(AsO_4)_3(OH)_4{\cdot}5H_2O$	2021-085	$P\bar{4}3m$	Obdilya mine	Kyrgyzstan	no
Touretite	$LiAl_8Be_4(B_{11}Be)O_{28}$	2023-003a	$P\bar{4}3m$	Ambalabe pegmatite	Madagascar	yes
Ertlite	$NaAl_3Al_6(Si_4B_2O_{18})(BO_3)_3(OH)_3O$	2023-086	*R*3*m*	Sahatany Valley	Madagascar	yes
Karlseifertite	$Pb(Ga_2Ge)(AsO_4)_2(OH)_6$	2024-007	$R\bar{3}m$	Tsumeb Mine	Namibia	yes
Argentotennantite-(Fe)	$Ag_6(Cu_4Fe_2)As_4S_{13}$	2023-126	$I\bar{4}3m$	San Genaro Mine	Peru	no
Tarutinoite	$Ag_3Pb_7Bi_7S_{19}$	2023-122	*C*2/*m*	Tarutinskoe deposit	Russia	yes
Chromviskontite	$Pb_5Cu_2(CrO_4)_3(SeO_3)(OH)_6$	2024-019	$Pmn2_1$	Tolbachik Volcano	Russia	no
Vegrandisite	$BaCl_2$	2023-045a	*Pnma*	Biely Vrch deposit	Slovakia	yes
Modraite	$Ca_{19}Fe^{2+}Al_4(Al_6Fe^{2+}_2)(\square_4)\square(SiO_4)_{10}(Si_2O_7)_4(OH)_{10}$	2023-108a	*P*4/*nnc*	Little Carpathian Mountains	Slovakia	yes
Auropolybasite	$[Ag_9AuS_4][Ag_6Sb_2S_7]$	2024-006	*P*321	Šibenicný vrch deposit	Slovakia	no
Chinleite-(Ce)	$NaCe(SO_4)_2(H_2O)$	2024-009	$P3_221$	Blue Streak Mine	U.S.A.	no
Hoperanchite	$(NH_4)_2(S_2O_3)$	2024-017	*C*2/*m*	Hope Ranch	U.S.A.	yes
Cabrerite[b]	$NiMg_2(AsO_4)_2{\cdot}8H_2O$	2023-123	*C*2/*m*	Nickel Mine	U.S.A.	yes
Domitrovicite	$Zn(C_2H_3O_3)_2{\cdot}2H_2O$	2023-125	$P2_1/c$	Pusch Ridge	U.S.A.	yes
Rasmussenite	$Ca(C_2H_3O_3)_2{\cdot}3H_2O$	2024-018	$P\bar{1}$	Pusch Ridge	U.S.A.	yes

Notes: The type locality names have been simplified for readability and are organized by country of origin. The "New RN" column conveys which mineral names introduce a new root name.
[a] The data contained within this chart were derived from Newsletters 79 and 80 (Bosi et al. 2024a, 2024b), individual references for each mineral can be found within.
[b] Published or in press (as of September 2024).

essential elements in auropolybasite are also shared by criddleite and thunderbayite, although both of these minerals also contain essential Tl. The pearceite-polybasite group consists of a series of Ag(-Cu) chalcogenide minerals with layered structures comprising two distinct layer modules. The nomenclature of the pearceite-polybasite group was revised by Bindi et al. (2007), wherein the names "antimonpearceite" (now a synonym of polybasite-*Tac*) and "arsenpolybasite" (now a synonym of pearceite-*T*2*ac*) were discarded on the basis that pearceite and polybasite be redefined based on chemical—rather than structural—differences. Pearceite was defined as having essential As in the A module, whereas polybasite has essential Sb at this site. The new minerals cupropearceite (IMA2007-046) and cupropolybasite (IMA2008-004) were approved shortly after the nomenclature revision by Bindi et al. (2007). With the recent approvals of auropolybasite, argentopearceite (IMA2020-009), and argentopolybasite (IMA2021-119), there are a total nine pearceite-polybasite group minerals. The auropolybasite holotype specimen (catalog number P1P 61/2021) is deposited in the collection of the Department of Mineralogy and Petrology of the National Museum in Prague, Czech Republic.

Recently Published

This section includes several recently approved minerals that have been published (or entered press) since May 2024.

Cuprozheshengite, $Pb_4CuZn_2(AsO_4)_2(PO_4)_2(OH)_2$

Cuprozheshengite (IMA2021-095a) is a new dongchuanite group mineral co-described from the Laochang ore field and Dongchuan mine in Yunnan, China (Sun et al. 2024). The dongchuanite group is a new group of triclinic Pb-Zn(-Cu) phosphate(-arsenate) minerals comprising dongchuanite $[Pb_4ZnZn_2(PO_4)_4(OH)_2]$, cuprodongchuanite $[Pb_4CuZn_2(PO_4)_4(OH)_2]$, zheshengite $[Pb_4ZnZn_2(AsO_4)_2(PO_4)_2(OH)_2]$, and cuprozheshengite $[Pb_4CuZn_2(AsO_4)_2(PO_4)_2(OH)_2]$. All four minerals occur at the Dongchuan copper mine in Yunnan, China, in association with veszelyite $[Cu_2Zn(PO_4)(OH)_3{\cdot}2H_2O]$ and hemimorphite. On the holotype specimen of cuprozheshengite, the new mineral is associated with veszelyite and galena. The new mineral arsenoveszelyite $[Cu_2Zn(PO_4)(OH)_3{\cdot}2H_2O$; IMA2021-076a] also occurs in this assemblage. These minerals occur in stratiform sediment-hosted copper deposits hosted within Mesoproterozoic rocks of the Dongchuan group and Doushantuo formation (Sun et al. 2024). Cuprozheshengite is triclinic, $P\bar{1}$ with cell parameters $a = 4.7977(8)$, $b = 8.5789(8)$, $c = 10.3855(9)$ Å, $\alpha = 97.270(8)°$, $\beta = 101.902(12)°$, $\gamma = 91.495(11)°$. Compared to zheshengite [$a = 4.7727(4)$, $b = 8.4864(6)$, $c = 10.4053(7)$ Å, $\alpha = 97.083(6)$, $\beta = 101.002(7)$, $\gamma = 93.072(6)°$], cuprozheshengite has a marginally larger cell that differs most notably in the *b* dimension and γ interaxial angle. A holotype specimen is deposited in the collections of the Geological Museum of China in Xisi, Beijing, China (catalog number M16127). Two co-type specimens are deposited in the collections of the Natural History Museum of Los Angeles County, California, U.S.A., with catalog numbers 76191 and 76192, and an additional co-type specimen is deposited with the Crystal Structure Laboratory at the China University of Geosciences in Beijing, China (catalog number DC4).

Calcioveatchite, $SrCaB_{11}O_{16}(OH)_5{\cdot}H_2O$

Calcioveatchite (IMA2020-011), ideally $SrCaB_{11}O_{16}(OH)_5{\cdot}H_2O$, is a new Ca-Sr ordered analogue of veatchite $[Sr_2B_{11}O_{16}(OH)_5{\cdot}H_2O]$ discovered at the Nepskoe potassium salt deposit in Irkutsk oblast, Russia (Pekov et al. 2024). A Ca-Sr ordered analogue of veatchite was first noted at the Nepskoe deposit by Rastsvetaeva et al. (1993), although the phase was not submitted to the IMA-CNMNC for consideration as a distinct mineral species. Interestingly, veatchite was first described from the Lang Mine in California by Switzer (1938) as a purely Ca borate mineral, as Switzer had mistaken the Sr for Ca; this was later corrected by Switzer and Brannock (1950). Veatchite has several polytypes: veatchite-1*M*, -2*M*, and -*A*. The holotype specimen

of calcioveatchite is reported to be the 1*M* polytype of the new mineral. Both veatchite and calcioveatchite are monoclinic, $P2_1$. Despite the presence of cation ordering in calcioveatchite-1*M*, both veatchite-1*M* [a = 6.7127(4), b = 20.704(1), c = 6.6272(4) Å, β = 119.209(1)°] and calcioveatchite-1*M* [a = 6.7030(3), b = 20.6438(9), c = 6.6056(3) Å, β = 119.153(7)°] have nearly identical cell parameters. A holotype specimen is deposited in the collections of the Fersman Mineralogical Museum, Moscow, Russia (catalog number 97013).

Jianmuite, $ZrTi^{4+}Ti^{3+}_5Al_3O_{16}$

The new mineral jianmuite (IMA2023-057), ideally $ZrTi^{4+}Ti^{3+}_5Al_3O_{16}$, was described from co-type samples from the Allende meteorite as well as the Cr-11 orebody at the Kangjinla Cr deposit in Tibet, China, and recently published in Borriello et al. (2025). Jianmuite is the 6th new mineral from the Cr-11 orebody and the 20th new mineral described or co-described from the Allende meteorite. The chemistry of jianmuite is similar to that of carmeltazite ($ZrAl_2Ti_4O_{11}$), although jianmuite is reported to have a novel structure type (Borriello et al. 2025). Jianmuite is unusual in that it has mixed Ti valence and a dominant Ti^{3+} composition—the only other valid minerals with essential mixed-valence Ti are kaitianite ($Ti^{3+}_2Ti^{4+}O_5$) and magnéliite ($Ti^{3+}_2Ti^{4+}_2O_7$). Trivalent Ti is extremely rare on Earth, and very few minerals have species-defining Ti^{3+}. Two terrestrial localities have been prolific sites for reduced Ti mineral assemblages: Mt. Carmel (Israel; e.g., magnéliite and sassite) and the Kangjinla Cr deposit (China; e.g., jianmuite). Jianmuite is also unusual in that it was co-described with both terrestrial and extraterrestrial samples. This has occurred for grossite, keplerite, and nazarovite. Notably, these three minerals were co-described with terrestrial analogues from the Hartrurim basin in Israel, which is another famous locality for unusually reduced and mineralogically diverse assemblages. A holotype specimen is stored in the collections of the Geological Museum of China in Beijing, China, with catalog number GMCTM2023005. A co-type specimen is stored in the collections of the National Museum of Natural History of the Smithsonian Institution in Washington, D.C., U.S.A., with the catalog number USNM 3510-5.

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