

Alkaline and Related Rocks: A Glossary of Names

This glossary is only a rough guide to the bewildering nomenclature of alkaline and related rocks. "Subtleties", like the chemistry of a specific mineral, are very important for finding the right name for your rock. The list presented here is by no means exhaustive and includes only the most frequently used terms. Please refer to Le Maitre (2002) for the IUGS-endorsed rock-classification guidelines and further details.

- Agpaite (agpaitic foid syenite)** Any peralkaline feldspathoid syenite containing Na and/or K titano-, zircono- or niobosilicates (such as lorenzenite, eudialyte, lamprophyllite, murmanite, wadeite, lovozerite, etc.). The enrichment of agpaitic rocks in "incompatible" elements may also be reflected in the composition of their major constituents (e.g., high Zr content of aegirine, etc.). *For Appat, Ilímaussaq complex, South Greenland.*
- Alkali basalt** A collective term for extrusive mafic rocks containing modal or normative feldspathoids (usually nepheline). Olivine and Ti-rich augite are the dominant ferromagnesian silicates in these rocks. *For enrichment of these rocks in alkalis relative to subalkali basalts; the etymology of the term "basalt" is uncertain.*
- Basanite** A collective term for extrusive mafic rocks containing essential modal or normative feldspathoids (usually nepheline) and olivine. *Etymology uncertain.*
- Carbonatite** Igneous rock containing >50% modal carbonate (usually calcite, dolomite or ankerite) and various ferromagnesian silicate minerals (olivine, monticellite, clinopyroxenes, calcic amphiboles or biotite). Characteristic accessory constituents (gaining locally the status of rock-forming minerals) are magnetite, fluorapatite, pyrochlore, ilmenite, perovskite, titanite and rare-earth (fluoro)carbonates. Carbonatites are further classified on the basis of their texture and mineralogy or major-element chemical composition (e.g., alvikite, calcite carbonatite, natrocarbonatite, etc.). *For the predominance of carbonates in the mineral mode.*
- Essexite** Nepheline monzogabbro or monzodiorite consisting of augite, intermediate plagioclase and calcic amphibole (typically kaersutite) with lesser amounts of alkali feldspar, nepheline and olivine. *For Essex Co., Massachusetts, USA.*
- Fergusite** A variety of foidolite containing essential clinopyroxene and 30-70% modal leucite (typically replaced by a mixture of nepheline, alkali feldspar, kalsilite and analcime). *For Fergus Co., central Montana, USA.*
- Feldspathoid (foid) syenite** A collective name for phaneritic rocks containing 10-60% of nepheline, sodalite, or any other feldspathoid mineral among their light-colored silicate constituents. Foid syenites are further classified on the basis of

their mineralogy, bulk-rock chemistry and texture (e.g., sodalite syenite, peralkaline agpaitic nepheline syenite, lujavrite, etc.). *For the presence of essential feldspathoids in their modal composition and affinity to syenite, i.e. an alkali-feldspar rock from Syene (Aswân, southern Egypt).*

- Foidolite** A collective name for phaneritic rocks containing > 60% of nepheline, leucite, or any other feldspathoid mineral among their light-colored silicate constituents. Foidolites are further classified on the basis of their mineralogy (e.g., nephelinolite, urtite, italite, etc.). *For the predominance of feldspathoid (foid) minerals over feldspars and λίθος = stone (Ancient Greek).*
- Foskorite** See **Phoscorite**.
- Foyaite** Massive or trachytoidal hypersolvus nepheline syenite (commonly peralkaline). *For Mt. Foia, Monchique, western Algarve, Portugal.*
- Ijolite** A variety of foidolite containing essential clinopyroxene (diopside, aegirine-augite or aegirine) and 30-70% modal nepheline; apatite, Ca-Fe-Ti garnets, biotite, titanite, magnetite and perovskite are common minor constituents. *For R. Iijoki, northern Finland.*
- Italite** A variety of foidolite in which leucite is the predominant feldspathoid mineral and ferromagnesian silicates comprise 30 modal % or less of the rock. *For Italy.*
- Kakortokite** Cumulate-textured peralkaline nepheline syenite typically showing alkali-feldspar-, arfvedsonite- and eudialyte-rich layers. *For Quaqqortoq, Ilímaussaq complex, South Greenland.*
- Kamafugite** A collective name for extrusive potassic ultramafic rocks (2.0-8.5 wt.% K₂O, 8-18 wt.% MgO, 33-44 wt.% SiO₂) commonly containing modal or normative kalsilite. All members of the clan contain either clinopyroxene or olivine as their dominant mafic constituents, and, in addition to kalsilite or leucite, may also contain melilite. These rocks are further categorized on the basis of their mineralogy (e.g., mafurite = olivine-clinopyroxene foidite with kalsilite as the principal feldspathoid mineral; ugandite = clinopyroxene-olivine leucitite). *For katungite, mafurite and ugandite, the three earliest-recognized members of the clan from different localities in Uganda.*
- Kimberlite** Potassic ultramafic rock with a high content of volatiles (especially CO₂) containing xenolithic material from the mantle and crust, as well as minerals liberated from these xenoliths (i.e. xenocrysts, including diamond) and those precipitated from the parental kimberlitic magma and its derivative fluids at different stages in the evolution history of the host rock. The latter category includes some of the macrocrysts, as well as (micro)phenocrysts, groundmass

constituents and late-stage minerals developed at the expense of primary magmatic phases. Kimberlites commonly show an inequigranular texture arising from the presence of xenoliths and macrocrysts (> 0.5 mm), although aphyric aphanitic kimberlites also occur. The macrocryst suite typically includes olivine, pyroxenes, phlogopite, ilmenite and pyrope. The matrix of hypabyssal kimberlites typically comprises crystals of olivine, monticellite, phlogopite, perovskite, spinel-group minerals (ranging in composition from Mg-rich chromite to Mg-rich ulvöspinel to Fe-rich spinel to Ti-rich magnetite) and apatite immersed in a carbonate-serpentine mesostasis. *For Kimberley, Northern Cape, South Africa.*

Lamproite

Peralkaline ultrapotassic rocks with a wide range of SiO₂ (typically 34-58 wt.%, but up to 68 wt.% in some varieties) and MgO values (typically, 5-27 wt.%), characterized by the presence of certain K-rich minerals (e.g., Ti-rich and Al-poor phlogopite, Fe-rich leucite, priderite) and absence of certain other minerals incompatible with the ultrapotassic nature of lamproitic magmas (e.g., liquidus plagioclase, nepheline, melilite and calcic garnets). Lamproites are further classified on the basis of their mineralogy and textural characteristics (e.g., glassy olivine-lamproitic tuff, diopside-leucite-phlogopite lamproite, etc.). *For λαμπρός = bright (Ancient Greek).*

Lamprophyre

Porphyritic meso- to melanocratic rocks forming shallow intrusions (rarely extrusive units) and containing phenocrysts of biotite, amphibole, clinopyroxene or olivine set in a matrix consisting of potassium feldspar, plagioclase, foids, calcite, Fe-Ti oxides and various ferromagnesian silicates. Lamprophyres are further classified on the basis of their mineralogy (e.g., monchiquite, camptonite, etc.). *For λαμπρός = bright (Ancient Greek) and in allusion to their biotite-/amphibole-phyric nature.*

Leucite phonolite

See **Phonolite**.

Leucitite

A collective name for extrusive rocks containing essential modal or normative Leucite; if other feldspathoid minerals (e.g., nepheline) are present, leucite has to predominate. Leucitites can be further classified on the basis of their mineralogy (e.g., ugandite = melanocratic clinopyroxene-olivine leucitite). *For the presence of essential leucite in their composition.*

Lujavrite

Meso- to melanocratic trachytoidal peralkaline nepheline syenite (commonly agpaitic). *For Lujavr Urt (Lovozero Mts.), Kola P-Ia, northwestern Russia.*

Melilitite

A collective name for extrusive and shallow intrusive rocks containing > 10% modal melilite, devoid of kalsilite and, if other feldspathoid minerals are present, F < melilite. Extrusive rocks of indeterminate modal

composition, but containing > 10% normative larnite (Ca_2SiO_4) are classified as melilitite, potassic melilitite or olivine melilitite depending on their Na/K ratio and proportion of olivine in their composition. *For the presence of essential melilite in their composition.*

Melilitolite

A collective name for plutonic rocks containing > 10% modal melilite and, if feldspathoid minerals are present, $F < \text{melilite}$. Melilitolites commonly contain olivine, clinopyroxene, perovskite, nepheline, or haüyne, and can thus be further classified based on the relative proportion of these minerals (e.g., kugdite, okaite, etc.). *For the presence of essential melilite in their modal composition and λίθος = stone (Ancient Greek).*

Melteigite

A variety of foidolite containing essential clinopyroxene (diopside, aegirine-augite or aegirine) and 10-30% modal nepheline; apatite, Ca-Fe-Ti garnets, biotite, titanite, magnetite and perovskite are common minor constituents. *For Melteig Farm, Fen carbonatite complex, Telemark, southern Norway.*

Miaskite

Leucocratic hypersolvus foid (monzo)syenite containing calcic albite, perthite, and nepheline \pm cancrinite-group minerals as the principal foid minerals. Biotite is the major mafic mineral, while ilmenite, zircon and pyrochlore are characteristic accessory constituents (cf. **Agpaité**). *For Miass, South Urals, Russia.*

Missourite

A variety of foidolite containing essential clinopyroxene and 10-30% modal leucite; olivine is also commonly present. *For R. Missouri, Montana, USA.*

Naujaite

Agpaitic (nepheline-)sodalite syenite with a poikilitic texture comprising crystals of feldspathoid minerals enclosed in alkali feldspar and ferromagnesian silicates. *For Naajakasik (formerly Naujakasik), Ilímaussaq complex, South Greenland.*

Nephelinite

A collective name for extrusive rocks containing essential modal or normative nepheline and little or no feldspar. If other feldspathoid minerals (e.g., leucite or analcime) are present, nepheline has to predominate. Phenocrysts of clinopyroxene (augite, diopside and aegirine-augite), titanite and Ca-Fe-Ti garnets, and groundmass aegirine are common. *For the presence of essential nepheline in their composition.*

Orangeite (Group-II kimberlite; micaceous

Peralkaline ultrapotassic volatile-rich rocks superficially similar to kimberlites, but distinct from the latter in lacking monticellite, Mg-rich ulvöspinel and kinoshitalite, and containing abundant phlogopite (as macrocrysts, microphenocrysts and groundmass grains) and clinopyroxene microphenocrysts

kimberlite)	(commonly, diopside mantled by Ti-rich aegirine-augite). Sr-, Zr- and rare-earth-bearing minerals (perovskite, apatite, Ca-Fe-Ti garnets, etc.) are characteristic accessory constituents in the groundmass. <i>For the Orange Free State (now Free State), central South Africa.</i>
Phonolite	An extrusive analogue of feldspathoid syenite; if the dominant feldspathoid is other than nepheline, a mineral modifier must be added to the root name (e.g., leucite phonolite). <i>Apparently, for the high-pitch sound it makes when struck with a hammer: φωνή = voice and λίθος = stone (Ancient Greek).</i>
Phonolitic foidite	A collective name for extrusive rocks containing essential modal feldspathoids and subordinate amounts of feldspar (typically, as a groundmass phase). Phenocrysts of clinopyroxene (augite, diopside and aegirine-augite) and titanite are common. Depending on their predominant feldspathoid minerals, these rocks can be further classified as phonolitic nephelinite, phonolitic leucitite, etc. <i>For their modal composition, "intermediate" between foidites and phonolites.</i>
Phoscorite	Plutonic rock containing essential magnetite, apatite and either forsterite or phlogopite; some researchers extend this term to incorporate rocks with essential diopside. Phoscorites are almost invariably found in association with carbonatites, and commonly contain minor amounts of calcite and accessory Ti, Nb and Zr oxides (baddeleyite, pyrochlore, zirconolite, etc.). <i>For the Phosphor Development Corporation of South Africa.</i>
Pulaskite	Nepheline-bearing alkali feldspar syenite. <i>For Pulaski Co., central Arkansas, USA.</i>
Shonkinite	A melanocratic variety of feldspathoid syenite containing a large proportion (> 60% modal) of mafic silicates (typically, augite, biotite and olivine) and < 10% modal feldspar. <i>For Shonkin, the Native-American name for the Highwood Mountains, Chouteau Co., central Montana, USA.</i>
Silicocarbonatite	A variety of carbonatite which contains > 20 wt.% SiO ₂ in its bulk-rock chemical composition. In addition to carbonates, silicocarbonatites contain significant amounts of ferromagnesian silicates (forsterite, diopside, aegirine-augite, phlogopite, or calcic amphiboles). <i>For the chemical composition and affinity to carbonatites.</i>
Sodalitolite	See Tawite .
Tawite	A variety of foidolite in which sodalite is the predominant feldspathoid mineral. <i>For R. Tavajok, Lovozero Mts., Kola P-Ia, northwestern Russia.</i>

**Teschenite
(teschinite)**

Analcime gabbro; typically comprises calcic plagioclase, augite, olivine and analcime. *For Cieszyn and Český Těšín (Teschen in German) at the border between Poland and Czech Republic.*

Theralite

Nepheline gabbro; typically comprises calcic plagioclase, augite, nepheline and variable amounts of olivine. *Etymology uncertain; allegedly, for the relative rarity of this rock type (from the Ancient Greek for "to pursue").*

Urtite

A variety of foidolite containing > 70% modal nepheline; clinopyroxene, apatite, titanite, magnetite and perovskite are commonly present in subordinate amounts. *For Lujavr Urt, (Lovozero Mts.), Kola P-1a, northwestern Russia.*