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## Glossary

This glossary contains simple explanations of the more important technical terms used in Chapters 1 and 2 and in the 'Introduction, Highlights' and 'Conclusions' sections of Chapters 3 to 6. The particular context of the igneous rocks of southwest England is reflected in these explanations. Stratigraphical terms are omitted as they are placed in context within the figures and tables. With reference to igneous rocks the following grain sizes generally apply: coarse-grained – strictly over 5 mm (in practice, often over 3 mm); medium-grained – 1–5(3)mm; fine-grained – under 1 mm.

**Acid:** light-coloured igneous rocks relatively enriched in silica ( $\text{SiO}_2$ , nominally over 65%); also known as felsic and silicic.

**Actinolite:** non-aluminous amphibole; see ferromagnesian minerals.

**Adinole:** see metasomatism.

**Agglomerate:** a volcanoclastic rock composed of large, often angular, rock and mineral fragments.

**Albite:** sodic plagioclase feldspar.

**Alkali feldspar:** see feldspar.

**Allochthon:** rock unit not in its place of formation.

**Allotriomorphic:** in igneous rocks, textural term referring to the majority of minerals having poor crystal shape.

**Amphiboles:** see ferromagnesian minerals.

**Anatexis:** partial melting, especially in the context of progressive melting of sediments to form granite.

**Andesine:** sodic/calcic plagioclase feldspar.

**Andesite:** a fine-grained, intermediate igneous rock consisting mainly of plagioclase feldspar and ferromagnesian minerals; usually a lava.

**Aplite:** fine-grained, often light-coloured intrusive rock usually of acid composition; found in veins and narrow dykes.

**Aphyric:** non-porphyritic.

**Argillite:** a general term for fine-grained clay-rich elastic sedimentary rocks.

**Augite:** a pyroxene; see ferromagnesian minerals.

**Aureole:** the envelope of metamorphic rocks adjacent to an igneous intrusion.

**Autochthon:** rock unit at its place of formation.

**Basalt:** a fine-grained, basic igneous rock consisting largely of the minerals: plagioclase feldspar and ferromagnesian minerals, especially pyroxenes and olivine; usually a lava or a dyke.

**Basic:** dark-coloured igneous rocks relatively enriched in  $\text{MgO}$ ,  $\text{FeO}$ ,  $\text{CaO}$ , etc. – the 'bases' of early chemistry;  $\text{SiO}_2$  relatively low (nominally 45–52%).

**Basification:** the metasomatic process by which a rock is enriched in the basic components without melting.

**Biotite:** a brown mica; see ferromagnesian minerals.

**Breccia:** a volcanoclastic or sedimentary or fault-related rock composed of very large, angular rock fragments.

**Cale-flinta:** metamorphosed calcareous mudstone.

**Clast:** a fragment.

**Clinopyroxene:** see pyroxenes.

**Compatible elements:** elements which prefer the solid to the magma during crystallization and melting.

**Diapir:** a body, e.g. of igneous rock/magma, that has risen in consequence of its lower density and/or greater plasticity; often cylindrical and steep sided.

**Diorite:** a coarse-grained, relatively lime-rich, intermediate igneous rock, consisting largely of plagioclase feldspar and various ferro-magnesian minerals; often in large intrusions (batholiths/plutons).

**Dolerite:** a medium-grained, basic igneous rock, consisting largely of plagioclase feldspar and the ferromagnesian minerals: pyroxene and olivine; found in dykes or sills.

**Dunite:** an ultrabasic igneous rock consisting largely of the ferromagnesian mineral, olivine.

**Dyke:** a sheet-like body of igneous rock which cross-cuts the structure of the rocks it intrudes; often steeply inclined.

**Elvan:** a Cornish term for quartz–feldspar porphyry; usually a dyke.

**Fades:** an assemblage of rocks and/or minerals and/or fossils which is characteristic of a particular environment and/or process.

**Feldspathization:** a metasomatic process by which the (alkali) feldspar content of the rock is increased.

**Feldspars:** a series of aluminosilicate minerals between calcium/sodium-rich plagioclase and potassium/sodium-rich alkali feldspar, e.g. orthoclase and microcline; the most abundant minerals in the Earth's crust.

**Felsic:** igneous rocks (usually) which are rich in feldspars and quartz.

**Ferromagnesian:** silicate minerals enriched in iron and/or magnesium (and/or lime, etc.) e.g. olivine, pyroxenes (augite, hypersthene), amphiboles (hornblende, actinolite, tremolite), micas (biotite, muscovite).

**Flaser:** an intensely laminated shearing texture in metamorphosed igneous rocks.

**Fluidization:** the mobilization that results from the passage of a fluid (usually a gas) through a granular solid.

**Flysch:** an assemblage (facies) of clastic sedimentary rocks characterized by turbidites.

**Gabbro:** a coarse-grained, basic igneous rock consisting largely of plagioclase feldspar and the ferromagnesian minerals: pyroxene and olivine; usually occurs in large intrusions (batholiths/plutons).

**Gneiss:** a coarse-grained, often banded metamorphic rock

**Graben:** a fault-bounded rift or trough.

**Granite:** a coarse-grained, acid igneous rock consisting largely of alkali feldspar and quartz; usually in large intrusions (batholiths/plutons).

**Granitization:** the metasomatic process by which rock is converted to granite without melting.

**Granodiorite:** a coarse-grained acid igneous rock intermediate between granite and diorite.

**Granulite:** a granular metamorphic rock

**Greenschists:** general term for foliated, green coloured, metamorphic rocks of low grade basic or ultrabasic composition.

**Greenstone:** general term for massive basic igneous rocks that have been (partly) metamorphosed.

**Greisen:** a rock, often a granite, that now consists of quartz and mica because its feldspars have been broken down by hydrothermal activity.

**Greywacke:** a poorly sorted, clastic sedimentary rock composed of fragments of rocks and crystals set in a clay-rich matrix.

**Harzburgite:** a coarse-grained, ultrabasic igneous rock consisting largely of the ferro-magnesian minerals olivine and ortho-pyroxene.

**Hornblende:** a ferromagnesian mineral.

**Hornfels:** a hard, massive metamorphic rock formed by the thermal effects of hot magma.

**Hyaloclastites:** volcanoclastic rocks composed

largely of glassy fragments.

**Hydrothermal alteration:** mineralogical and chemical changes in rocks brought about by the penetration of hot, aqueous fluids.

**Hypidiomorphic:** in igneous rocks, textural term referring to a mixture of well and poorly shaped crystals.

**Idiomorphic:** in igneous rocks, textural term referring to the majority of minerals having good crystal shape.

**Igneous rocks:** formed by the consolidation (usually crystallization) of a magma.

**Incompatible elements:** those elements which prefer magma to the solid during crystallization and melting.

**Intermediate:** igneous rocks intermediate in composition between acid and basic.

**Initial ratio:** the isotopic ratio of a rock before radioactive decay.

**Isotopes:** forms of a chemical element that differ only in the number of neutrons within their atomic nuclei.

**I-type granite:** formed by the partial melting of an igneous source rock.

**Kaolinization:** the process by which feldspars are broken down to kaolinite by waters of magmatic and/or meteoric origin.

**Keratophyre:** metamorphosed trachyte.

**Lamprophyre:** a group of igneous rocks of very varied composition, but often rich in potassic minerals; usually in dykes.

**Lherzolite:** a coarse-grained ultrabasic igneous rock consisting largely of the ferromagnesian minerals olivine and pyroxene.

**LIL:** the large-ion-lithophile group of elements – Cs, Ba, Rb, Th, U, K, La, Ce, Sr and Nd.

**Magma:** molten rock; referred to as lava when erupted at the Earth's surface.

**Mafic:** see basic and ferromagnesian.

**Metamorphic rocks:** rocks whose texture and mineralogy have been changed in the solid by heat and/or pressure (i.e. without melting).

**Metasomatism:** the fluid-assisted modification of bulk-rock chemistry that may often occur during metamorphism e.g. 1. sodic metasomatism to form adinole, an albite-rich hornfels at dolerite margins, and 2. widespread potassic metasomatism in the contact aureoles of granite intrusions.

**Meteoric water:** water derived directly from the atmosphere.

**Micas:** a group of ferromagnesian minerals.

**Microcline:** a potassium-rich feldspar.

**Migmatite:** a mixed rock, i.e. with both igneous and metamorphic components.

**Minette:** a lamprophyre rich in the ferromagnesian mineral biotite mica.

**Moho:** the Mohorovičić seismic discontinuity between the Earth's crust and mantle.

**MORB:** mid-ocean ridge basalt.

**Muscovite:** a mica; see ferromagnesian minerals.

**Nappe:** a rock unit which has been displaced laterally by Earth movements.

**Obduction:** the thrusting of (part of) one lithospheric plate over another, e.g. during plate convergence.

**Oligoclase:** a sodic plagioclase feldspar.

**Olistostrome:** a rock unit that has gravity glided from its original setting.

**Olivine:** a ferromagnesian mineral.

**Ophiolite:** a genetic association of mainly basic and ultrabasic igneous rocks thought to represent ancient oceanic crust.

**Ophitic:** an igneous texture where well-formed plagioclase crystals are enclosed within the ferromagnesian mineral pyroxene; characteristic of dolerites.

**Orthoclase:** a potassic feldspar.

**Orthopyroxene:** see pyroxene.

**Palingenesis:** the 're-birth', i.e. re-intrusion, of a granite after anatexis.

**Parautochthonous:** close to its place of formation.

**Pegmatites:** exceptionally coarse-grained acid (common) or basic igneous rocks.

**Pelite:** a general term for fine-grained, clay-rich, elastic sedimentary rocks; often applied to metamorphosed mudstones.

**Peridotite:** a coarse-grained, ultrabasic igneous rock consisting largely of the ferromagnesian minerals pyroxene and olivine.

**Perthite:** potassium feldspar crystals containing veins and pods of albite.

**Phyllite:** a metamorphic rock rich in the ferromagnesian mineral mica that is texturally intermediate between slate and schist.

**-phyric:** denotes the type(s) of the larger crystals in a porphyritic igneous rock.

**Picrite:** a fine-grained ultrabasic igneous rock rich in the ferromagnesian mineral olivine; usually a lava, or cumulate associated with small intrusions.

**Plagioclase:** a feldspar.

**Porphyroclastic:** where fragments of large crystals remain within a fine-grained, sheared matrix.

**Porphyritic:** igneous rocks in which the large crystals (megacrysts, phenocrysts) occur in a matrix of finer crystals and/or glass.

**Pneumatolytic:** strictly, implies a gas phase; see hydrothermal alteration.

**Pyroclastics:** rocks composed largely of fragments of igneous rocks formed during volcanic eruptions.

**Pyroxene:** a ferromagnesian mineral; ortho-pyroxenes being Ca-poor, whereas clino-pyroxenes are Ca-rich.

**Quartz:** a mineral composed entirely of silica (SiO<sub>2</sub>).

**REE:** the fifteen rare-earth elements or lanthanides of Period 6 of the Periodic Table e.g. La, Ce, Pr, Nd, Sm.

**Rhyolite:** a fine-grained to glassy acid igneous rock; usually a lava.

**Rudaceous:** applied to very coarse-grained, elastic sedimentary rocks (e.g. conglomerate).

**Schist:** a metamorphic rock with well-developed platy and/or linear fabric.

**Serpentinite:** a metamorphosed ultrabasic igneous rock that now consists largely of the ferromagnesian mineral serpentine.

**Sial:** that part of the Earth rich in silica and alumina, i.e. the continental crust.

**Sill:** a sheet-like body of igneous rock which in general does not cross-cut the structure of the rocks which it intrudes; often gently inclined.

**Siena:** the Earth's oceanic crust and (upper) mantle, i.e. rich in silica and magnesium.

**Spilite:** low-grade metamorphosed basalt.

**Slate:** clay-rich clastic sediments (usually) that have developed a pronounced parting (cleavage) under Earth pressures; usually of low metamorphic grade.

**Stoping:** the breaking off and envelopment of blocks of country rock (xenoliths) by intruding magma.

**S-type:** granite derived from partial melting (anatexis) of originally sedimentary rocks.

**Subduction:** the sinking of (part of) one lithospheric plate under another at a convergent plate boundary.

**Syenite:** a coarse-grained intermediate igneous rock consisting largely of alkali feldspar and various ferromagnesian minerals.

**Tholeiite:** basalt relatively deficient in alkalis.

**Tourmalinization:** the metasomatic process which gives rise to tourmaline as a replacement for feldspars and micas in granite, etc.

**Trachybasalt:** basalt enriched in alkalis and containing both plagioclase and alkali feldspar.

**Trachyte:** a fine-grained, intermediate igneous rock consisting largely of alkali feldspar and various ferromagnesian minerals; often a lava with a pronounced flow alignment.

**Transition elements:** some elements within Periods 4 and 5 of the Periodic Table, e.g. Sc, Ti, V, Cr, Mn, Fe, Co, Ni; characteristic of ferromagnesian and oxide minerals.

**Tremolite:** a non-aluminous amphibole; see ferromagnesian minerals.

**Troctolite:** a coarse-grained basic igneous rock consisting largely of plagioclase feldspar and the ferromagnesian mineral olivine.

**Tuff:** consolidated volcanic ash.

**Turbidite:** clastic sedimentary rock containing structures formed during its deposition from subaqueous turbidity currents; often of greywacke composition.

**Ultrabasic:** dark-coloured, coarse-grained igneous rocks consisting entirely of ferromagnesian minerals.

**Ultramafic:** see ultrabasic.

**Vesicles:** gas bubble cavities within consolidated lavas.

**Volcaniclastic rocks:** sedimentary rocks composed largely of volcanic rock fragments.

**Xenoliths(crysts):** exotic rock (crystal) fragments incorporated within magma (and the resultant igneous rock).

**Zeolites:** a group of low-temperature, hydrous, Ca, Na, K-bearing, aluminosilicate minerals.

## [References](#)