

# Volcano Glossary III

Modified from  
<http://volcanoes.usgs.gov/Products/Pglossary/pglossary.html> (USGS)

## **'A'a:**

Lava flows that are characterized by rough, broken rock fragments on the surface and top of the flow, and a molten center. As the flow is moving slowly the bottom stays in place and the front moves forward, while breaking up and then flowing over its own debris. Gas from the molten lava interior migrates to the top, but remains trapped in bubbles in the cooling rock. This makes the rock light and porous.

## **Ash:**

Fragments of rock, mineral and volcanic glass that are smaller than 2 mm on diameter. Ash is created during an explosive volcanic eruption from volcanic gas pressure or from the interaction of magma with external water (groundwater or surface water). Ash can rise very high during an eruption and form a very dense ash cloud.

## **Basalt:**

Black or dark gray, volcanic rock containing less than 52% silica (SiO<sub>2</sub>). Basalt has a low viscosity and commonly contains minerals of olivine, pyroxene and plagioclase.

## **Caldera:**

A large and generally circular, relatively shallow depression left near the summit of a volcano after the magma has erupted and its magma chamber has been (partially) emptied. After the release of magma the volcano is lacking its critical structural support and the rock overlying the magma chamber caves in forming the caldera.

## **Cinder Cone:**

An accumulation of volcanic fragments, called cinders, surrounding the vent or forming a steep conical hill downwind from a vent. Cinder cones can range from tens to hundreds of meters tall.

**Crater:**

A small (less than 1 km) circular depression left near the summit of a volcano after the magma has erupted. Craters may be filled with rubble after an explosive eruption, or contain a lava lake that cools after the eruption ends.

**Dike:**

Sheet-like bodies of magma that intrude into the rock surrounding a magma chamber, often forming planar sheets that may radiate out from the center of a volcano, or form cylindrical or cone-shaped layers. Formed when magma cracks a rock as it forces its way away from the main magmatic body and then solidifies.

**Effusive Eruption:**

An eruption where lava pours out onto the ground in a non-explosive manner.

**Eruption Cloud:**

Accumulations of tephra and gas that congregate downwind of an eruption. Often dark brown to gray in color, eruption clouds can drift thousands of kilometers and travel around the Earth in only a few days. These clouds also are called ash clouds.

**Fissure:**

Fracture or crack in rock. On a volcano, a fissure is often a site of lava eruption. Fissures may be formed as extensional cracks from the expansion of a volcano from magma intrusion, or they may represent eruption sites, fed by dikes that extend from a magma chamber to the surface.

**Fumaroles:**

Vents that release volcanic gases.

**Glass:**

A substance that has no crystal structure, formed by rapid cooling of magma. Glass of basaltic composition is also called sideromelane, whereas glass of granitic or rhyolitic composition is called obsidian.

**Lahar:**

An Indonesian word for rapidly flowing mixture of rock debris and water originating from a volcano. Also used to refer to volcano induced mudslides.

**Lapilli:**

Rock fragments between 2-64 mm in diameter ejected from an explosive volcanic eruption. May be composed of scoria, pumice and/or reticulite. Rounded tephra particles of tiny ash grains that are stuck together in the same size range are called accretionary lapilli.

**Lava:**

Magma or molten rock once it erupts onto the Earth's surface.

**Lava Tube:**

Natural channels through which lava travels beneath the surface of a flow. Tubes are formed by the crusting over of previous lava channels or pahoehoe flows. Because lava flows down slope, at the end of a flow the tubes are left empty with only residual lava on the sides of the tube.

**Magma:**

Molten or partially melted rock beneath the Earth's surface. Magma is generally composed of a liquid portion, a solid portion of crystallized minerals, solid rock from conduit walls and dissolved gasses.

**Mineral:**

Naturally occurring and inorganic solid compounds. Minerals have an orderly internal structure of

characteristic chemical compounds, crystalline structure and physical properties such as density and hardness.

**Obsidian:**

Dense, black volcanic glass usually composed of rhyolite. Forms when lava cools so rapidly that crystals didn't have time to form.

**Pahoehoe:**

Lava flows that have a smooth or ropy surface. Pahoehoe flows by advancement from small lobes or toes that continually break out from the cooling flow.

**Pele's Hair:**

Thin strands of volcanic glass. Formed by the stretching or blowing out of molten basaltic glass from lava fountains or vigorous flows. Named Pele's hair after the Hawaiian volcano goddess Pele.

**Pele's Tears:**

Small bits of molten lava shaped like tears often found at the end of a strand of Pele's hair.

**Phreatic Eruptions:**

Steam driven explosions that result when water beneath the ground is heated by magma, lava or hot rocks. After the water is heated and rapidly converts to steam, it generates explosions of steam, water, ash and rock fragments.

**Pillow Lava:**

Result from underwater basaltic lava flows. Flexible glassy crusts form around newly extruded lava in a bulky pillow shape. As pressure builds the crusts will eventually break and new basalt extrudes slowly and forms another pillow.

**Plinian Eruption:**

Large volcanic explosions that form dark columns of tephra, gas and ash clouds extending into the stratosphere. Named after the detailed eruption description of Mount Vesuvius in 79 A.D. by Pliny the younger.

**Pumice:**

Light, porous volcanic rock formed during explosive eruptions as dissolved carbon dioxide is erupted with the magma. Pumice is composed of a network of bubbles and volcanic glass and minerals. Pumice can be formed from all types of magma.

**Pyroclastic Flow:**

A cascade of hot ash, pumice, rock fragments and volcanic gas that travel down the side of a volcano similar to an avalanche. Pyroclastic flows can travel up to 100 km/hour.

**Reticulite:**

Pumice from basaltic magma, where the walls surrounding the gas bubbles have burst leaving only the stems between each three former bubble walls, and junctions at the intersection of four bubbles. This gives a rock a honeycomb structure. Though it seems light enough to float on water, reticulite does not, because the bubbles are open structures rather than enclosing a gas.

**Rhyolite:**

A rock with at least 68 weight percent silica ( $\text{SiO}_2$ ) and about 5 weight percent of both sodium and potassium. Common minerals in rhyolite are quartz, feldspar and biotite.

**Rift Zone:**

A system of fractures associated with an area that has undergone extension. Rift zones on Hawaii, have many different characteristics including dikes at depth, eruptive fissures, cinder and spatter cones, spatter ramparts, pit craters, lava flows, ground cracks and normal faults. Most shield volcanoes have pronounced rift zones along which much of its magma erupts. Rift zones

also develop at extensional plate boundaries where the crust drifts apart to form volcanoes along a long rift zone.

**Rock:**

Naturally occurring and hardened mixtures of minerals, glass or organic material. The three main types of rock are sedimentary, metamorphic and igneous. Sedimentary rocks are formed by weathering and mechanical sorting on the surface. Metamorphic rocks are formed when preexisting rocks are transformed under extreme temperature and pressure. Igneous rocks are derived from melting.

**Scoria:**

Vesicular glassy basaltic to andesitic lava rock originating from explosive eruptions. Scoria is high in iron content giving it a dark color.

**Shield Volcano:**

Volcanoes characterized by broad, gentle slopes built up by eruptions of basaltic lavas. Shield volcanoes tend to be enormous low angle cones with lava flows extending tens of kilometers away from an erupting vent. The name originates from the fact that these volcanoes resemble a warrior's shield.

**Spatter:**

Flattened and congealed fluid fragments of molten lava ejected from a vent.

**Spatter Rampart:**

A broad embankment of spatter along both sides of lava fountain erupting from a fissure.

**Spatter and Cinder Cone:**

A lava fountain that erupts spatter, cinder and other tephra which form a cone. These eruptions last much longer than those that make spatter ramparts.

**Stratovolcano:**

Steep conical volcanoes built by eruptions of lava flows, tephra and pyroclastic flows. Stratovolcanoes erupt a variety of magma types, all of which are explosive except basaltic magma. Stratovolcanoes consist of many vents near the center and along the flanks of the volcano. These volcanoes also are called composite cones.

**Strombolian Eruptions:**

Characterized by intermittent explosions or fountaining of basaltic lava from a single vent or crater. Each explosion is caused by the release of volcanic gas and can happen very rapidly, within minutes.

**Tephra:**

Fragments of volcanic rock ejected into the air by explosions and carried by hot gases in eruption clouds. Tephra includes all size fragments from large dense blocks to small light pumice and ash.

**Tsunami:**

A wave (or series of waves) generated by a large underwater disturbance. They are typically caused by earthquakes, landslides and volcanic eruptions.

**Vent:**

Openings in the Earth's crust where magma and volcanic gases escape. Vents can be circular, elongated fissures or small cracks in the ground.

**Volcano:**

A vent at Earth's surface through which magma and gases escape, as well as the associated cone build by effusive and explosive eruptions.

**Vulcanian Eruption:**

An explosive eruption that ejects new lava fragments that do not become rounded while in the air. This is possible because the lava is too viscous or already solidified. Vulcanian eruptions generally eject a large proportion of volcanic ash. Andesitic and dacitic magmas are most common because their high viscosity makes it difficult for the dissolved volcanic gases to escape, except under extreme pressure, leading to explosive eruptions.