

Volcanic Eruptions

Predicting Volcanic Eruptions

Evidence from a volcano’s history, earthquakes, slope deformation, and gas emissions can help predict future volcanic eruptions. Observation satellites are sometimes used to monitor changes in gas, temperature, and formations at volcanic sites.

Study Tip

Even dormant or inactive volcanoes are under observation and monitoring. For instance, a supervolcano at Yellowstone Park that is currently dormant erupts every several million years.

History of Volcanic Activity

- The time span between last eruption and previous eruptions are monitored.

Earthquakes

- The number and size of earthquakes increases before an eruption due to moving magma
- Scientists use seismographs that record the strength and duration of an earthquake to determine whether or not a eruption will occur in the near future



Small pyroclastic flow at Mayon volcano in the Philippines

Gas Emissions

- Sulfur dioxide, carbon dioxide, hydrochloric acid, and water vapor are several gasses that can be measured at volcanic sites
- The amounts of gases and their ratios are calculated to predict eruptions

Explosive Eruptions

Explosive eruptions are caused by gas-rich magma that churns within the magma chamber. This churning creates pressure, which can overwhelm and break through the rock that encases it.

Volcanic Material	Description
Tephra	The erupted rock fragments
Pyroclastic flow	Scorching hot tephra, ash, and gas
Lahar	Volcanic mudflow containing ash, rock, and water
Poisonous gasses	These gasses contribute to acid rain and ozone destruction

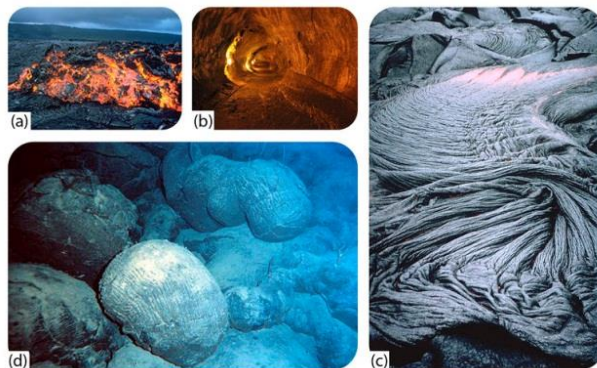
Effusive Eruptions

Effusive eruptions are caused by mafic magma buildup. Although the pressure builds enough for the magma to erupt, it does not erupt with the same force as felsic magma. The magma pushes toward the surface through fissures.

Type of lava flow	Description
A'a	Forms a thick and brittle crust that is torn into rough pieces.
Pāhoehoe	Forms lava tubes where fluid lava flows through the outer cooled rock crust. Smooth and ropy look
Pillow lava	Mafic lava that erupts underwater. The lava cools very quickly and forms roughly spherical rocks

Concept Check

- What kinds of evidence can scientists use to predict volcanic eruptions
- What causes an explosive eruption?
- What is pyroclastic flow?
- What causes an effusive eruption?
- What are three types of lava that flow from effusive eruptions?



a: A'a lava
b: Pāhoehoe lava tubes
c: Pāhoehoe lava
d: Pillow lava