

The Two Principal Types of Volcanoes

Shield Volcano

effusive

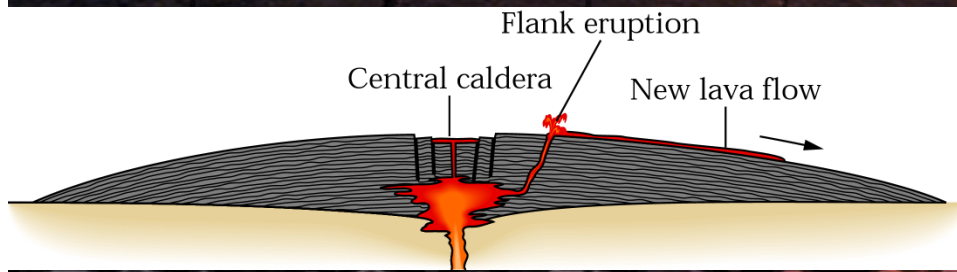


Image: S. Marshak "Earth, Portrait of a Planet"

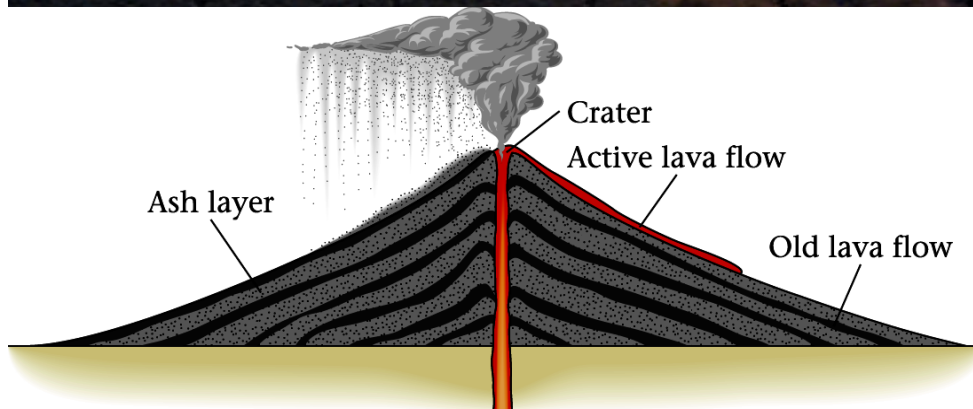
Mauna Kea, Hawaii



Hawaii; Etna; Iceland; Erta Ale, Nyamuragira/Africa

Composite Volcano (Stratovolcano)

explosive



Mt. Mayon, Philippines



Fuji; Vesuvius; St. Helens; Pinatubo; Popocatepetl

Examples of Composite Volcanoes

Mt. Mayon, Philippines



Mt. Fuji, Japan



Mt. Rainier



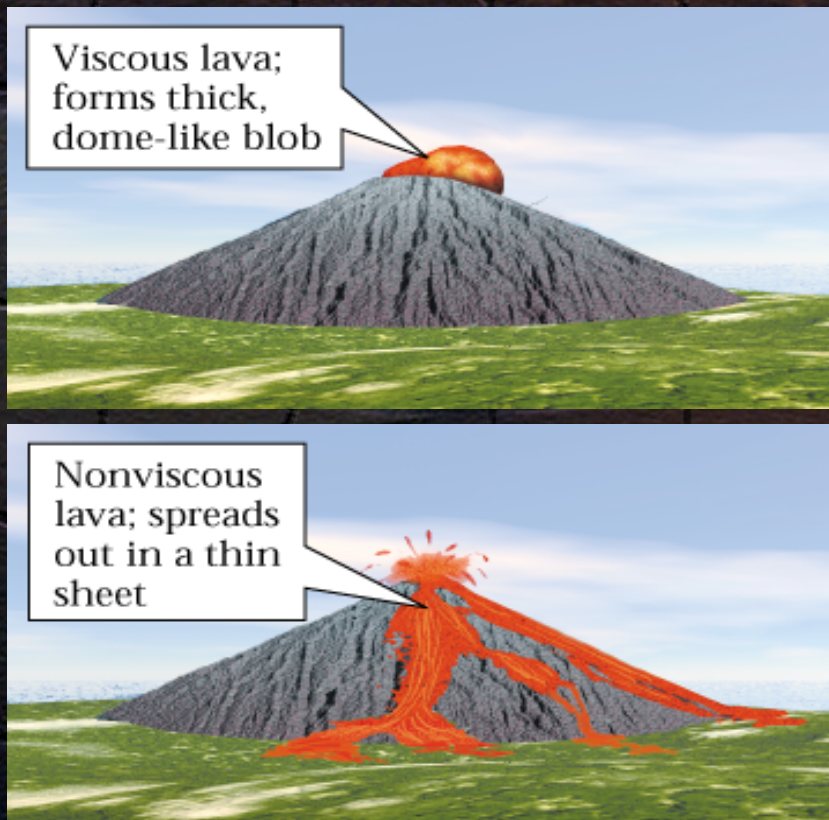
Mt. St. Helens



“...anything that looks beautiful is potentially dangerous...”

Viscosity

Lecture 3: resistance of material to flow



- high viscosity: lava clogs vents
-> explosive volcanism

- low viscosity: lava flows easily
-> effusive volcanism

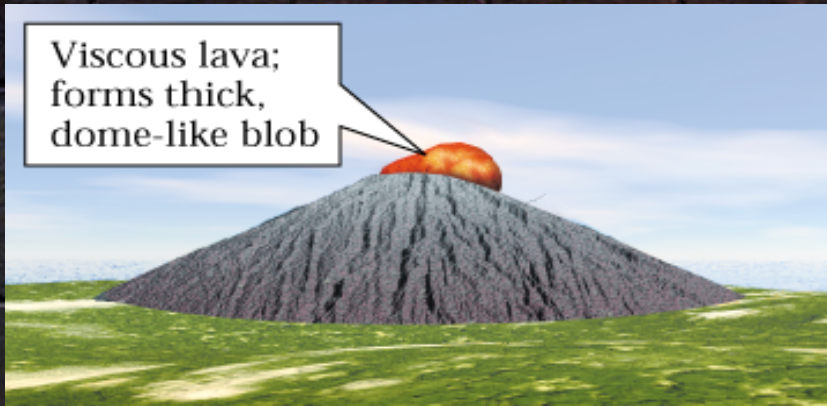
Image: S. Marshak "Earth, Portrait of a Planet"

The 2 Main Factors controlling Viscosity

**SiO₂ MAKES LAVA
MORE VISCOUS**

**HIGHER TEMPERATURE
DECREASES VISCOSITY**

Viscous lava;
forms thick,
dome-like blob



Nonviscous
lava; spreads
out in a thin
sheet

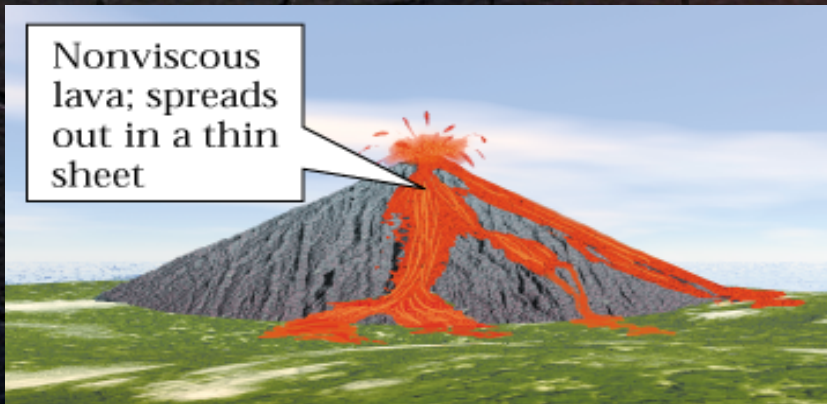


Image: S. Marshak "Earth, Portrait of a Planet"

MORE VISCOUS

- high-SiO₂ (Quartz)
- cold



LESS VISCOUS

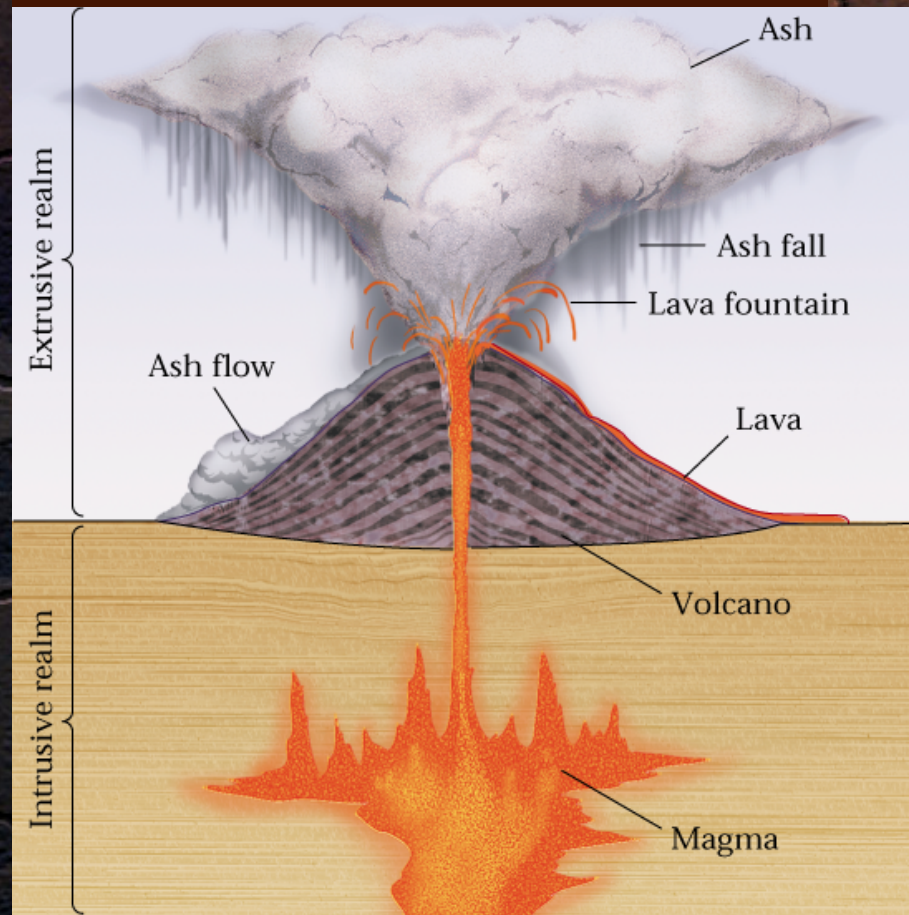
- low-SiO₂ (Olivine)
- hot



SiO₂ = silica

Magma and Lava

Image: S. Marshak "Earth, Portrait of a Planet"



LAVA

- surface
- volcanic
- extrusive

MAGMA

- underground
- plutonic
- intrusive