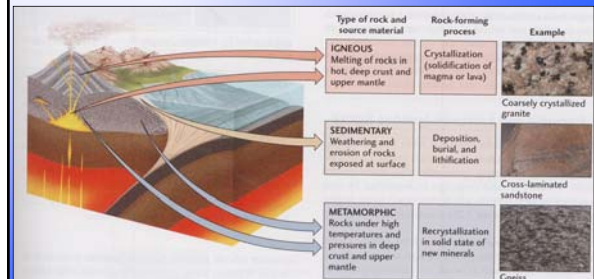


Formation of Igneous Rocks

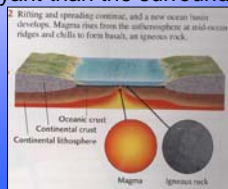


3 Major Types of Rocks

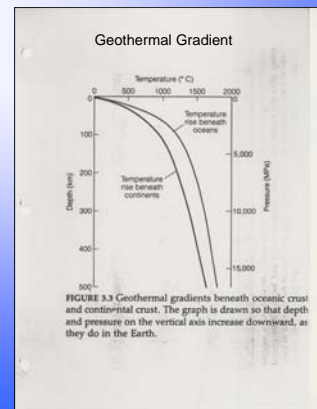


Magma: general term applied to molten rock in the interior of the Earth that has the properties of a liquid (e.g. magma flows)

Magma rises towards the Earth's surface because it is more buoyant than the surrounding rocks

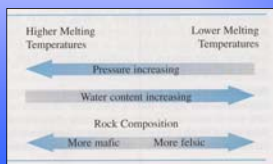


Geothermal Gradient



2 Causes of Melting in the Interior of Earth

1. Decompression Melting- lower pressure on hot rocks in the interior of Earth permitting melting
2. Flux Melting or Hydration- Addition of water to a substance lowers the melting point



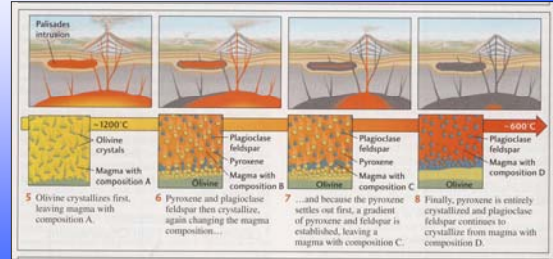
Composition of Magma

1. Felsic (rhyolitic)- high silica content
2. Intermediate (andesitic)
3. Mafic (basaltic)- high iron and magnesium content

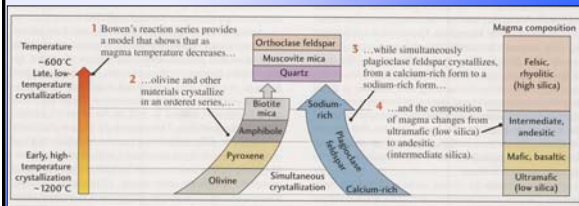
Origin of Different Compositions of Magma

1. Crystallization or Fractionation
2. Partial Melting
3. Source Area
4. Assimilation and Magma Mixing

Origin of Types of Magma: Crystallization or Fractionation



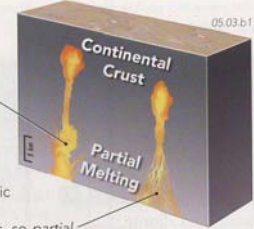
Crystallization of Magma



Partial Melting

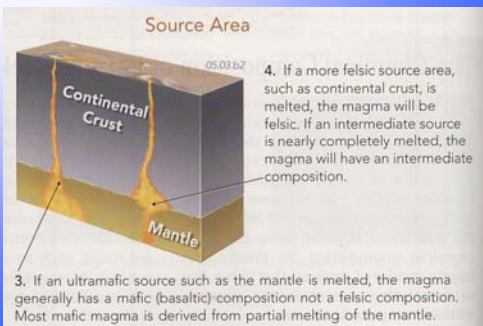
Partial and Nearly Complete Melting

1. If a magma could be generated from nearly complete melting of the source region, it would have a similar composition to the source. Complete melting is probably not common.

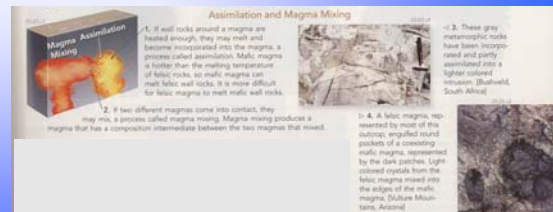


2. Most rocks melt by partial melting where some minerals melt before others. Felsic minerals generally melt at lower temperatures than mafic minerals, so partial melting will produce a magma that is more felsic than the source. For example, partial melting of a mafic source can yield an intermediate magma.

Source Area



Assimilation and Magma Mixing



Igneous Rock Textures

1. Phaneritic



2. Aphanitic



3. Glassy

