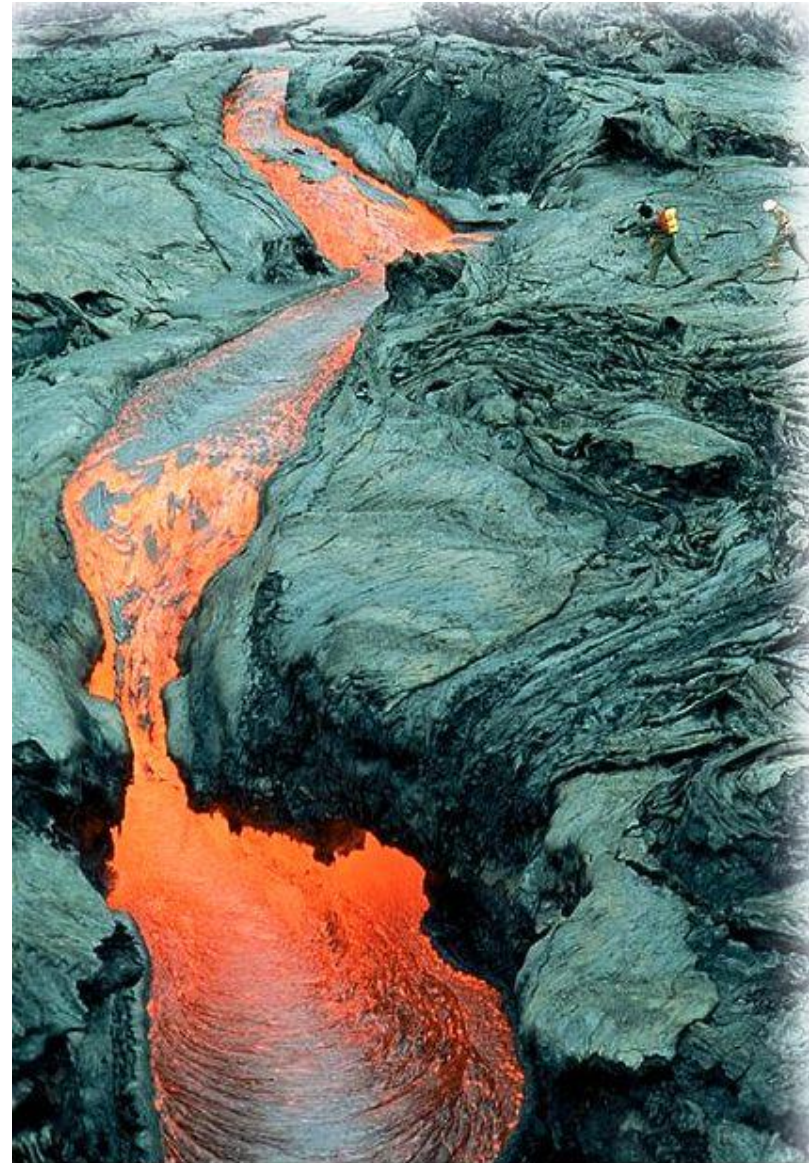
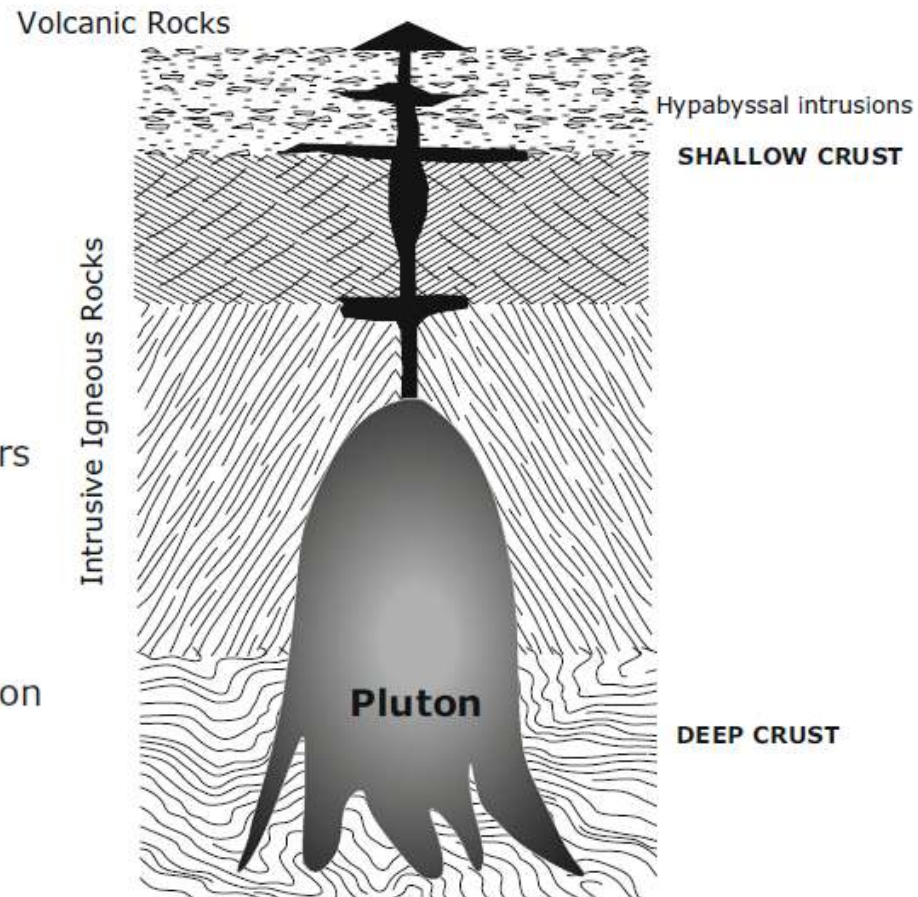
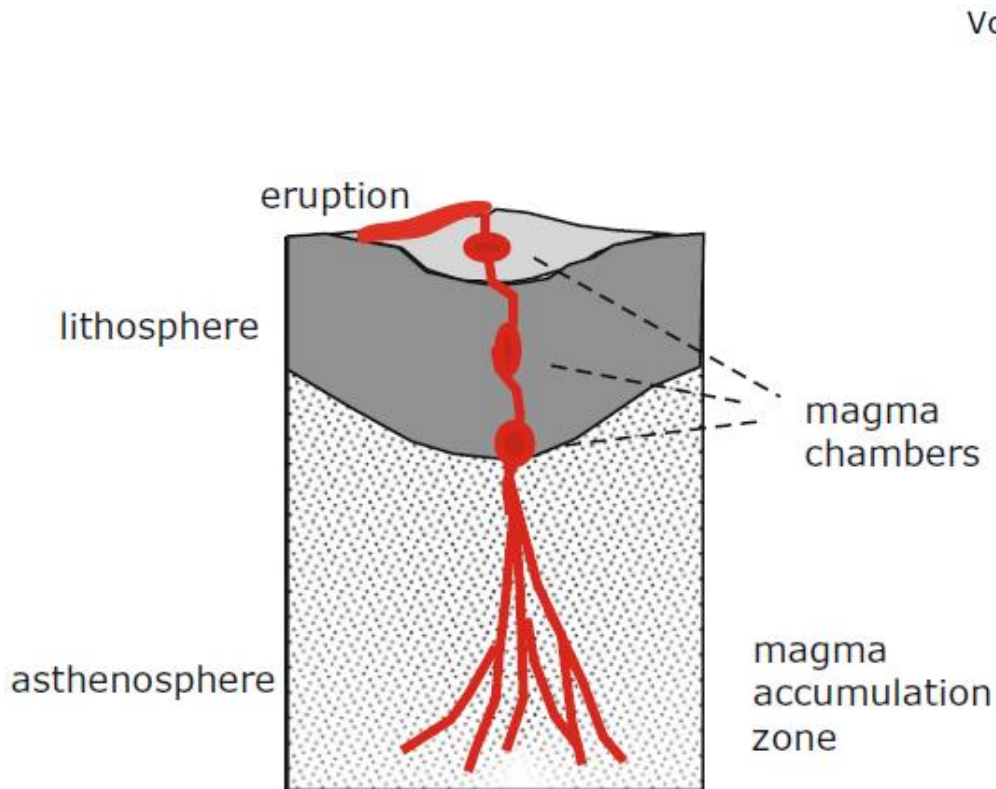
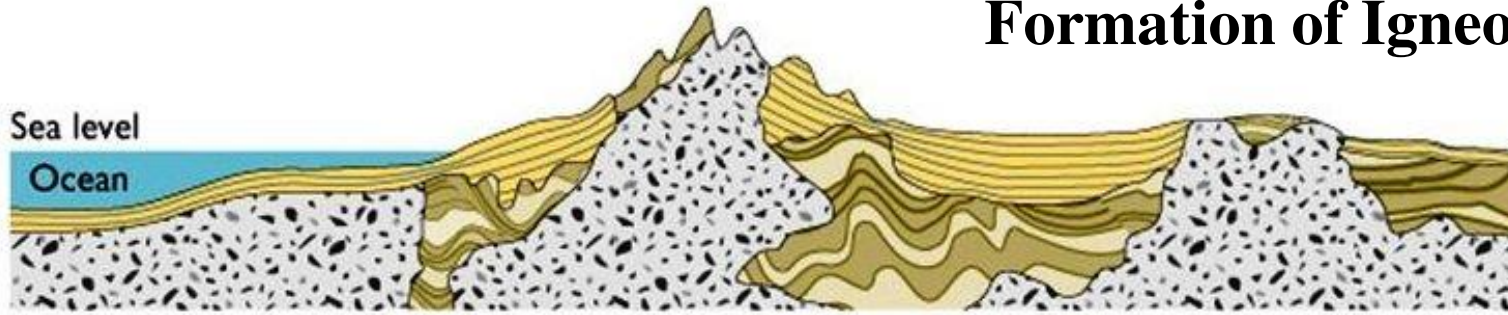


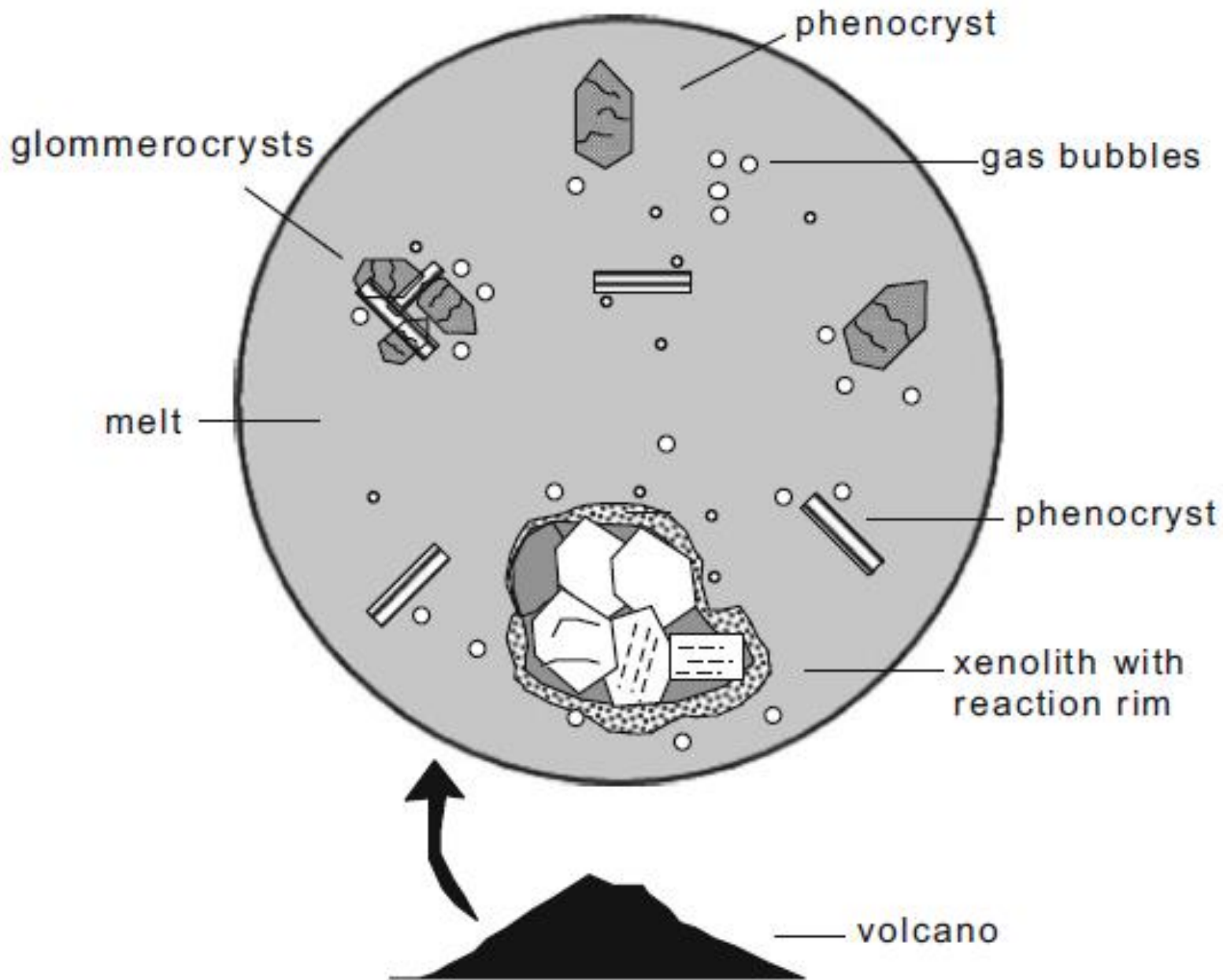
Igneous Petrology



Formation of Igneous Rocks

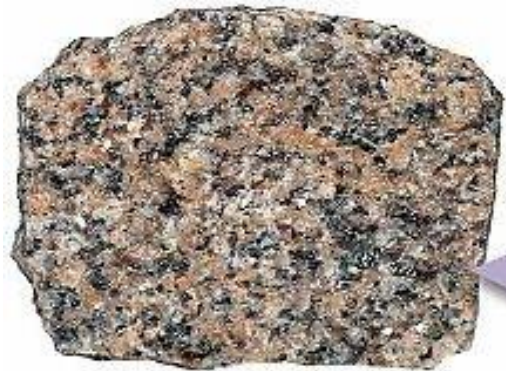


Components of Magma

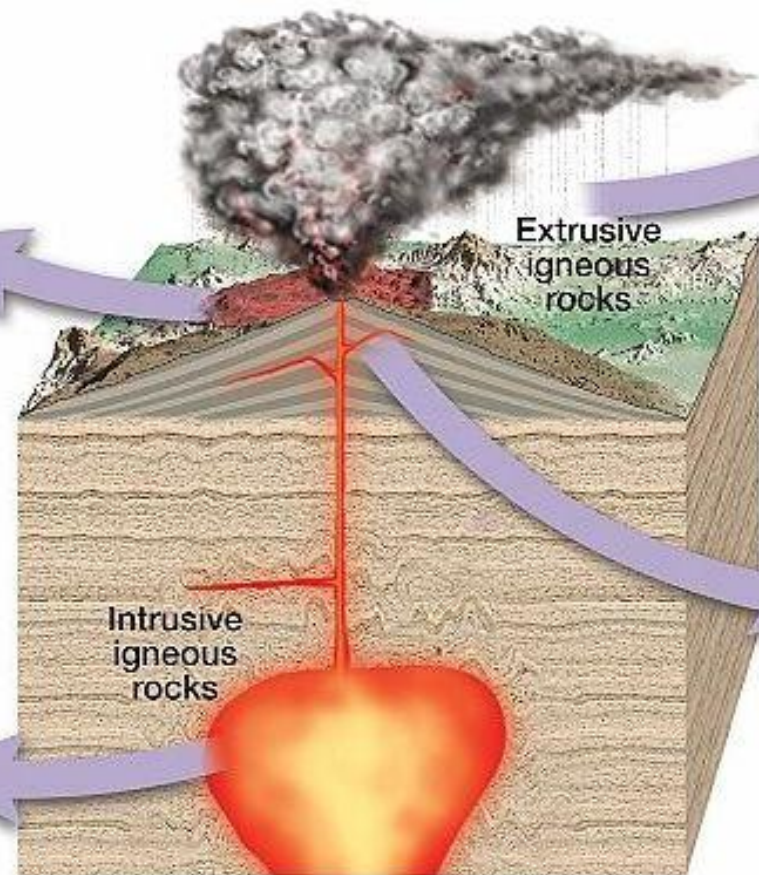




A. Fine-grained



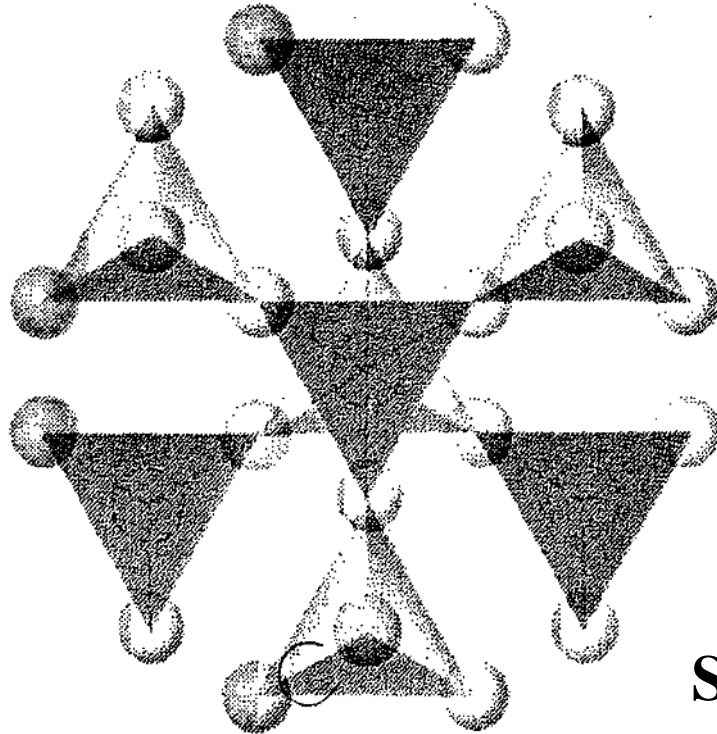
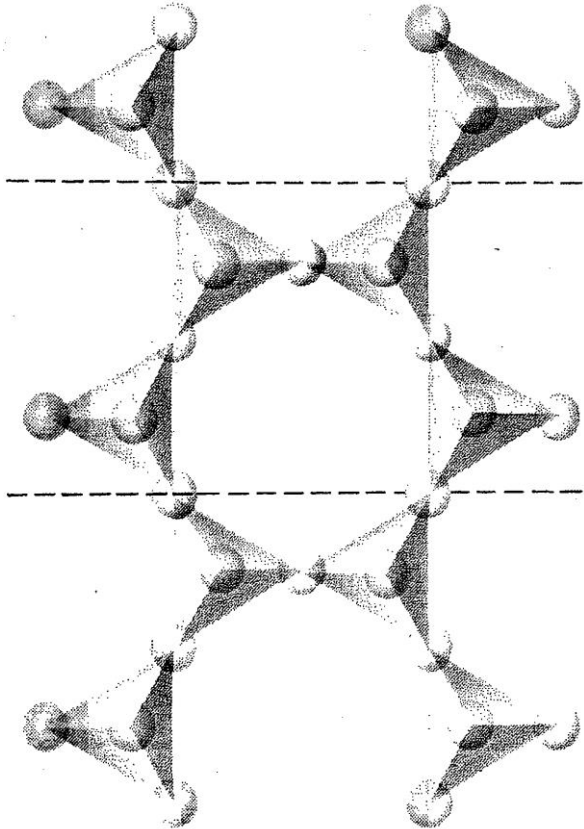
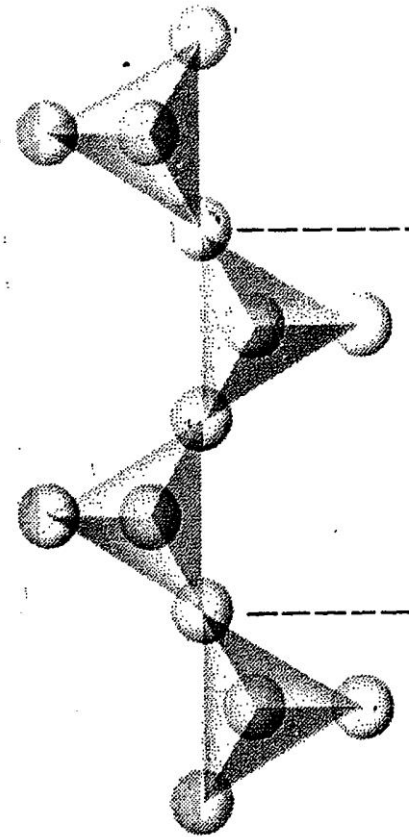
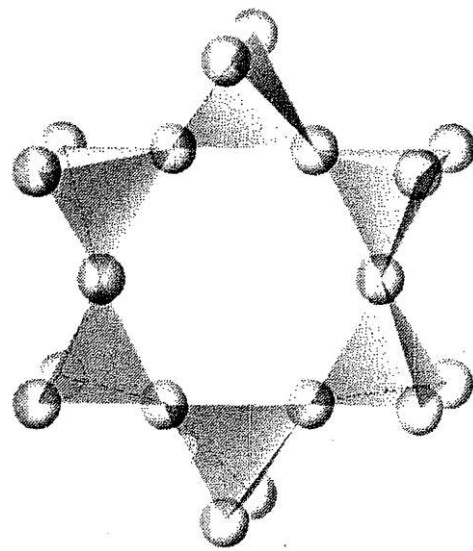
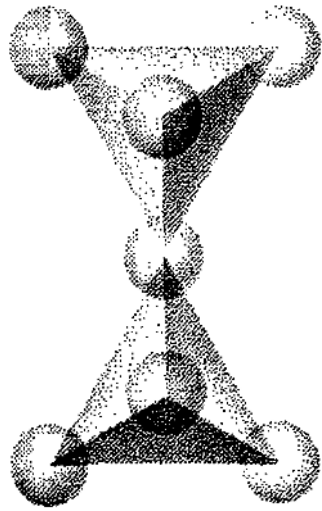
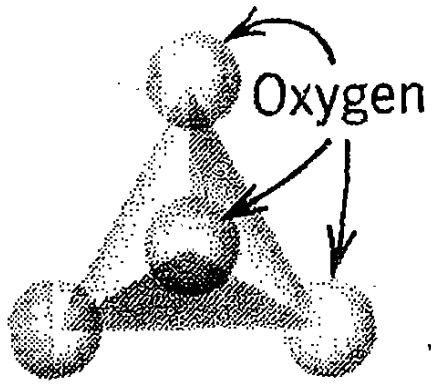
B. Coarse-grained



C. Glassy (pumice)



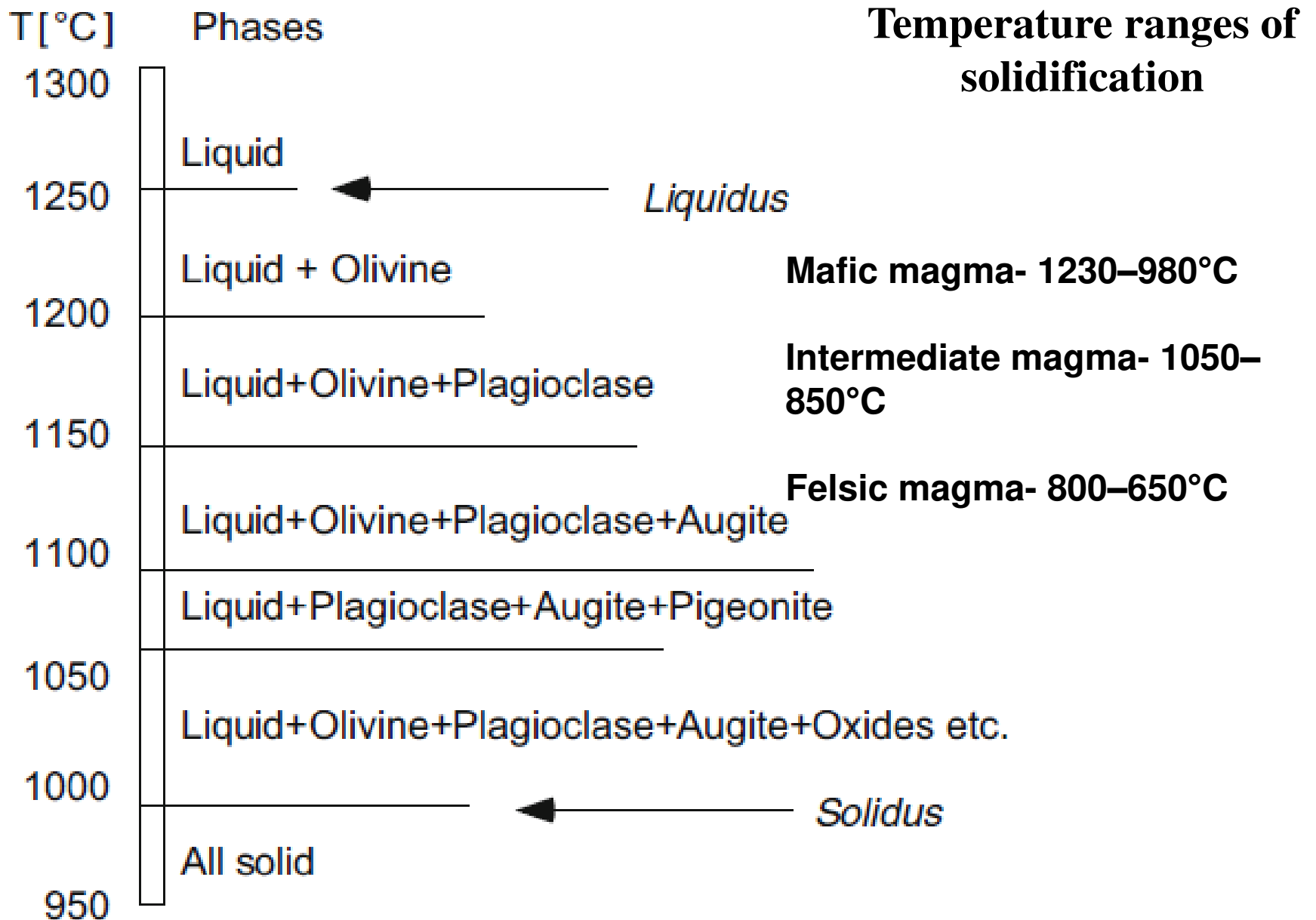
D. Porphyritic

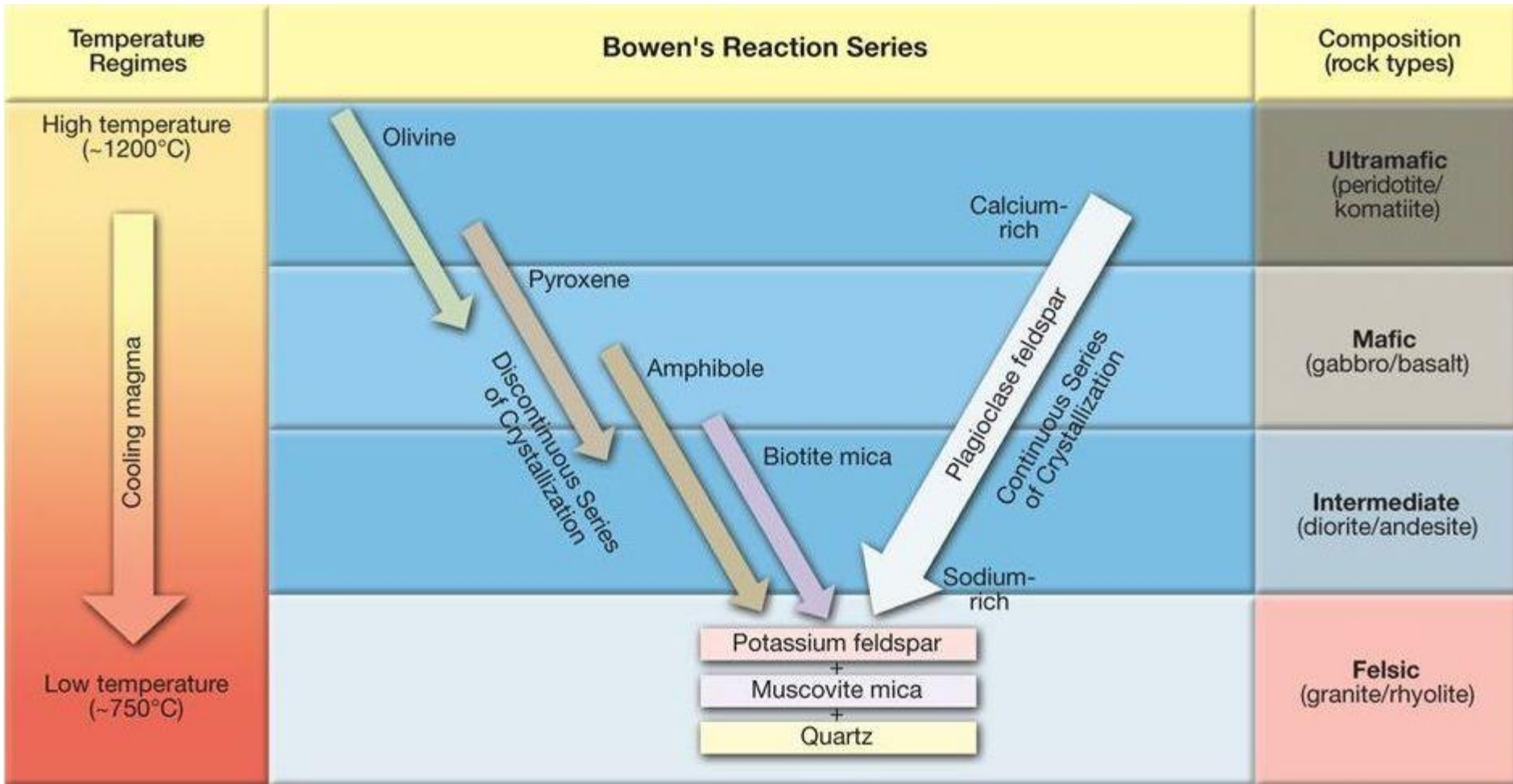


Silicate Minerals

Magma type	Ultramafic	Mafic
SiO ₂	42–48	46–54
MgO + FeO + MnO + Fe ₂ O ₃	35–46	15–28
Na ₂ O + K ₂ O	<1	2–3.5
Major minerals	Olivine (generally dominant) + pyroxenes	Plagioclase + pyroxene
Volcanic	Komatiite	Basalt
Hypabyssal	Komatiite	Diabase
Plutonic	Peridotite	Gabbro

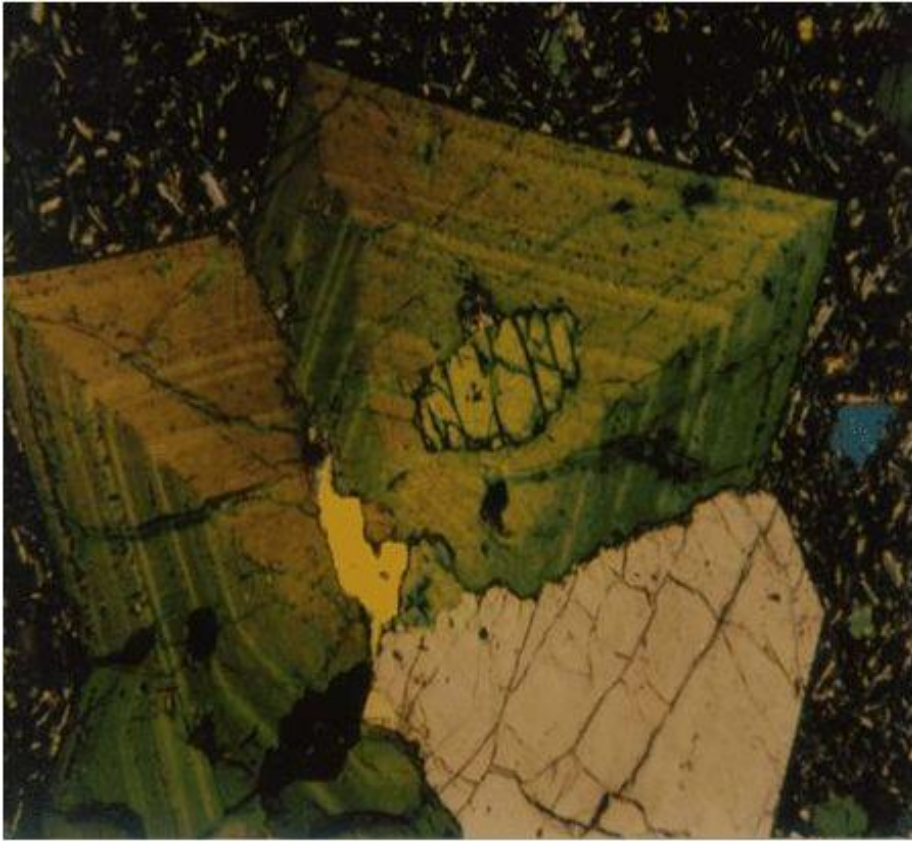
Magma type	Intermediate	Felsic
SiO ₂	60–65	>70
MgO + FeO + MnO + Fe ₂ O ₃	10–21	<3
Na ₂ O + K ₂ O	3–6	5–10
Major minerals	Pyroxene + plagioclase + amphibole	Alkali feldspar + quartz
Volcanic	Andesite	Rhyolite
Hypabyssal		
Plutonic	Diorite	Granite



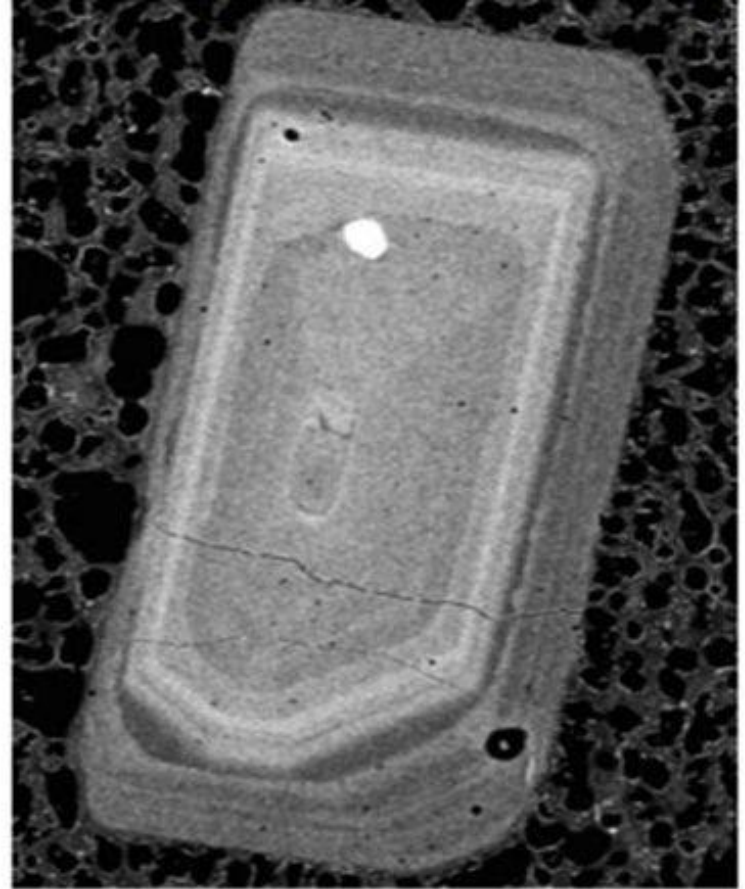


The Phenomenon of Fractional Crystallization

Bowen's Reaction in action



An olivine crystal surrounded by pyroxene in an extrusive (volcanic) igneous rock.



A zoned crystal of plagioclase in an igneous rock. The center (core) is Ca-rich and the edge (rim) is Na-rich.

Structures of Igneous Rocks- Plutonic Bodies

