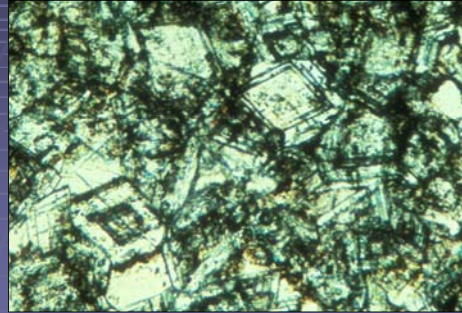


Mechanical Weathering: Thermal Expansion



Mechanical Weathering: Crystal Growth



Mechanical Weathering: Root Expansion



Chemical Weathering

Chemical breakdown of rock through alteration of minerals in the rock.

Water is the primary agent of chemical weathering.

Chemical Weathering: Dissolution

Breakdown of minerals into component ions.

Example: Gypsum dissolution

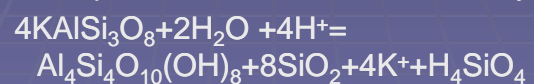


Chemical Weathering: Hydrolysis

Chemical reaction where H⁺ or OH⁻ ions replace ions within the mineral and produce a new mineral.

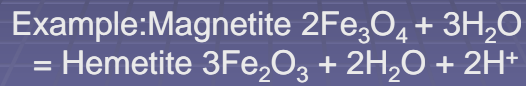
Main process forming clay minerals.

Example: Orthoclase to Kaolinite clay



Chemical Weathering: Oxidation

Oxygen is added to the structure of a mineral producing a different mineral.



Mineral Stability and Weathering

Table 7.2 Relative Stabilities of Common Minerals Under Weathering

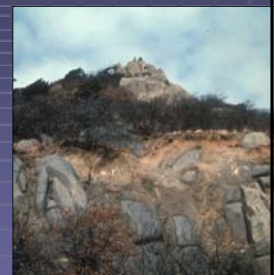
Stability of Minerals	Rate of Weathering
MOST STABLE	Slowest
Iron oxides (hematite)	↓
Aluminum hydroxides (gibbsite)	
Quartz	
Clay minerals	
Muscovite mica	
Potassium feldspar (orthoclase)	
Biotite mica	
Sodium-rich feldspar (albite)	
Amphiboles	
Pyroxene	
Calcium-rich feldspar (anorthite)	
Olivine	
Calcite	
Halite	
LEAST STABLE	Fastest

Factors Affecting Degree of Chemical Weathering

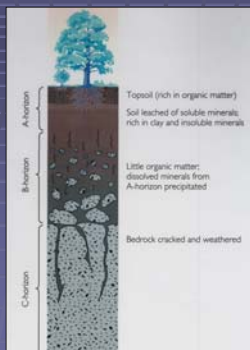
- 1) Climate= rainfall amount + temperature
- 2) Rock Composition= mineral stability
- 3) Flora and fauna present
- 4) Time

Soils

Formed from the Residue of weathering Combined with decayed organic matter (humus).

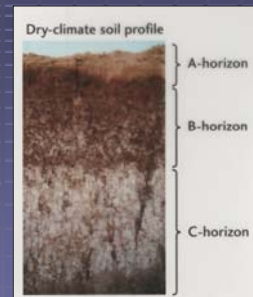


Soil Profile



Soil Maturity

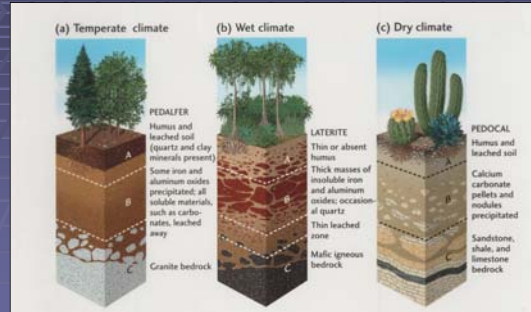
- 1) Mature soil contains all horizons fully developed
- 2) Immature soil- missing one or more of the horizons and horizons are poorly developed



Factors that Influence Soil Maturity

- 1) Climate
- 2) Composition of parent material-mineral stability
- 3) Time
- 4) Topography
- 5) Flora and Fauna present

Soil Types Reflect Climate



Soil Type: Dry Climate Pedocal



Soil Type: Temperate Climate Pedalfer



Soil Type: Humid Climate Laterite



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