

**Module 2. Basic Geology II**  
**b. Sediment and Sedimentary Rocks**

**Instructor:** Jim Lehane

**Time:** 90 minutes

**Weathering Processes**

There are 2 types of weathering processes

1. Mechanical Weathering – weathering due to physical means (i.e. wind, water, frost)
2. Chemical Weathering – weathering due to chemical means (i.e. rust, dissolution, hydration)

**Sediment Transport and Sedimentary Rocks**

Helpful Website: <http://www.dinojim.com/rocksandminerals.htm>

**Definitions**

There are 2 types of Sedimentary Rocks

Clastic – Formed from rock and mineral fragments that come from the breakdown of other rocks

Chemical – Formed from precipitation of chemical compounds out of solution

**Identifying Clastic Sedimentary Rocks**

**Grain Size**

Gravel – 2-4 mm	➤	visible
Sand – 1/16-2 mm	➤	
Silt – feels gritty	➤	not visible
Clay – feels smooth	➤	

**Major Minerals**

Quartz  
Feldspars  
Micas

**Rounding**

Angular → Well Rounded → Poorly Rounded

**Sorting**

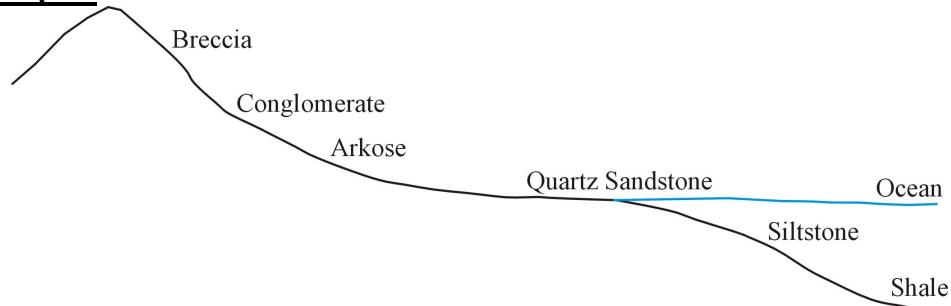
Poorly Sorted – Lots of size fragments in one rock

Well Sorted – same size fragments in one rock

**Cementation**

Cementing agents – Silica, Clay, Calcite, Hematite

**Sediment Transport**



	<u>Mature</u>	<u>Submature</u>	<u>Immature</u>
<b>Textural maturity</b>	Well rounded well sorted	====>	angular poorly sorted
<b>Compositional maturity</b>	Quartz clays	====>	Mica, feldspars rock fragments
<b>Distance to source</b>	Not close to source material	====>	Close to source material

### Identifying Chemical Sedimentary Rocks

Form from the precipitation of ions from solution in standing bodies of water.  
Lagoons, lakes, swamps and ocean basins

**Maturity is not an issue**

2 Types of Chemical Sedimentary Rocks:

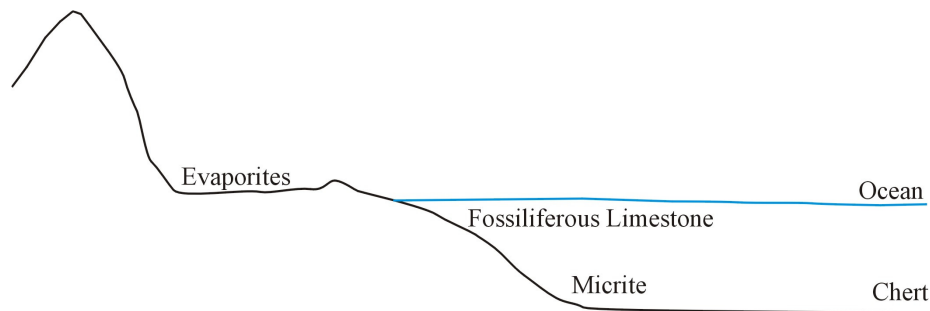
#### Biochemical –

- Organic debris – dead and decaying plant material
- Silica-based sediment – shells
- Carbonate shells – Microscopic animals forming lime mud

#### Inorganic –

- Iron Oxide – not currently forming
- Evaporite – Rock salt, rock gypsum
- Alteration – From a preexisting chemical rock

### Depositional Environment



### Features found in sedimentary rocks

- a. Ripple marks
- b. Mud cracks
- c. Trace fossils (burrows, foot prints, etc.)
- d. Body fossils
- e. Cross bedding
- f. Graded bedding

### Lithification

Lithification is the process of turning sediments into rock by the addition of heat, pressure, and sometimes a cementing agent. Usually done by the pressure of the overlying rocks with groundwater feeding the cementing compounds