

Quadrant II – Transcript and Related Materials

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Notes

Classification of Sedimentary Rocks

Sedimentary rocks are those which are formed by the processes of weathering, erosion, transportation, deposition, compaction, cementation and lithification. They may also formed by chemical precipitation, organically or by residual processes.

Sedimentary rocks are diverse, abundant at the earth surface and economically important. For these reasons much attention is given to the classification of the sedimentary rocks. Nevertheless no single classification scheme is accepted by all geologists. The variety of classification schemes has led to the same rock being assigned different names by different geologists.

For practical purpose and to identify and classify sedimentary rocks in the field, the most convenient and conventional scheme of classification is used. This classification is mainly based on the size of the fragments or particles in the

rocks, the composition and the processes involved in the formation of sedimentary rocks. Using these criteria the rocks are classified into two main groups **1) Clastic (detrital) Sedimentary rocks and 2) Non clastic sedimentary rocks.**

Clastic sedimentary rocks composed of the solid products of weathering (gravel, sand, silt and clay) cemented together by the dissolved weathering products. Based on the size of the fragments and particles, the sedimentary rocks are **classified as rudaceous (Psephites), arenaceous (Psammites) and argillaceous (Pelites).** In clastic sedimentary rocks, the terms used to detrital fragments and particles of varying sizes are boulders, cobbles, pebbles, gravels, sand, silt and clay. The universally accepted grain size scale in sedimentary petrology is derived **by Udden and Wentworth.** Accordingly the clastic sedimentary rocks are classified as follows.

Size in mm	Size Term	Loose Sediments	Consolidated Rocks
>256mm	Boulder	Gravel	Conglomerate (rounded Clast) Breccia (angular fragments)
64 - 256mm	Cobble	Gravel	
2- 64mm	Pebble	Gravel	
1/16 – 2mm	Sand	Sand	Sandstone, Arkose, Grit, Greywacke
1/256 – 1/16mm	Silt	Silt	Siltstone
<256mm	Clay	Clay	Claystone, Shale, Mudstone

Non clastic sedimentary rocks are further classified into three groups on the basis of their composition and the processes of formation (origin) **1) chemically precipitated rocks, 2) organically formed (biogenic) rocks and 3) residual sedimentary rocks.**

Chemically precipitated rocks are those which are formed by direct chemical precipitation of dissolved ions in the water. Such type of precipitation may take place in seas, oceans, lakes or around springs under favourable conditions. Examples of such rocks are limestones, dolomites, evaporites, gypsum, anhydrite, halites, and other rock salts.

Organic or biogenic sedimentary rocks are those composed of materials formed by the activity of organisms. For example limestones which are made up of the shells or other skeletal fragments of the organisms. Even the rocks formed by decay and decomposition of plants and other vegetal material are classified as residual rocks. For example coal.

Residual or sedentary rocks are those which are formed due to accumulation of residue insitu. For example laterite and bauxite.

Classification of sedimentary Rocks

Type Composition	Clastic	Non Clastic		
		Chemical	Organic	Residual
Rudaceous (Psephites) >2mm	Conglomerate Breccia	-----	-----	-----
Arenaceous (Psammites) 1/16-2mm	Sandstone Arkose, Grit Greywacke	-----	-----	-----
Argillaceous-silty 1/16-1/256mm	Siltstone	-----	-----	-----
Argillaceous – Clayey <1/256mm	Shale Mudstone Claystone	-----	-----	Clay
Siliceous	-----	Chert Flint Siliceous sinters	Diatomaceous earth Stromatolites	
Ferruginous	-----	Bog iron ore Clay iron stone	Bacterial iron ore	Laterite
Calcareous	-----	Marine limestone Stalactite Stalagmite Oolitic limestone	Algal limestone Foraminiferal limestone Shelly limestone Coral limestone	-----
Carbonaceous	-----	-----	Coal Peat Lignite Bituminous Anthracite	-----
Miscellaneous	Agglomerate Volcanic ash	Gypsum Anhydrite Dolomite Halite Common salt	Phosphates Guano deposits	Laterite Bauxite

