Sedimentology, Petrology and Stratigraphy of
Petra Sandstone

Farah A.M. Issa
B. Sc. (Geology)
Yarmouk University
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Thesis Defence Committee

1) Dr. Hakam Mustafa
   Chairman

2) Dr. Nagm El-Din Youssef
   Member

3) Dr. Mohammad Atallah
   Member
Abstract

Sedimentological, stratigraphical and petrographical study have been carried out for part of the Nubian Sandstone in Petra area. It is located south west Jordan. It is of Cambro-Ordovician age. The study area is divided into three subareas. El-Nabiis area at the western part which is subdivided into 7 units, Al-Khubtha area at the northern part which is subdivided into 5 units and the High-Place area at the southern part which is subdivided into 4 units.

For petrographical studies 82 samples were prepared and examined under the polarizing microscope. They are mostly composed of quartz arenite in addition to few layers of quartz arenite with high amount of mica. This quartz arenite is composed mainly of monocrystalline grains (85-95%) and the rest are polycrystalline grains of line and sutured contacts. In addition to quartz grains mica grains (biotite and muscovite) and heavy minerals (zircon, tourmaline, rutile and opaques) are found.

For grain size analysis 49 samples were investigated and different graphical parameters were graphed and calculated; histograms, frequency curves, cumulative frequency curves and cumulative frequency distribution were graphed. These sandstones are showing generally unimodal distribution for grains. They are leptokurtic to mesokurtic and nearly symmetrical to symmetrical skewed for most samples. Plotting of mean versus standard deviation, standard deviation versus
skewness and skewness versus kurtosis were graphed also. These plots are indicating fluvial (river) depositional environment for Petra sandstone.

These sandstones were affected by physical, chemical and mineralogical diagenetic processes. These are compaction, fracturing, overgrowth of quartz, alteration of mica feldspar and heavy minerals and cementation by silica, Fe-oxides, calcite and rock salts in addition to the effect of interstitial solutions. Physical and chemical weathering are affecting Petra sandstones. Physically, they are affected by insolation, water layer and salt action weathering. Chemically, they are affected by solutions and weathering of minerals according to their stabilities.

These sandstones were originated from plutonic source rocks that surrounding the area as a result of chemical weathering under humid conditions.