ON THE WEATHERING OF SYENITE UNDER ARID CONDITIONS

M.D. Al-Qudami, W.M. Shehata, A.A. Al-Harthi & A.A. Sabtan

Dept. of Engineering & Environmental Geology, Faculty of Earth Sciences,
King Abdulaziz University, Jeddah, Saudi Arabia.

ABSTRACT

Weathering, being a natural process that decreases rock strength and durability, requires special attention in investigating rock engineering. More studies are needed to evaluate weathering under arid conditions and its effects on the engineering properties of rocks. The susceptibility of rocks to weathering depends on many factors including mineralogical composition, grain size, texture, intensity of structures and environmental conditions. The recognition of the grade of weathering of rocks will lead to a better prediction of its engineering properties.

Different grades of weathered syenite occurrences from Abla area, northeast of Al-Baha, where arid to semiarid environment prevails, were field investigated and studied in the laboratory for their, petrographical, physical and mechanical properties. The syenites of similar weathering grades show distinct range of porosity, saturation index and density values. It also gives characteristic compressive strength, deformational behavior, dynamic Poisson's ratio and dynamic modulus of elasticity values. Both the static and dynamic rock durability indicators were evaluated for all the syenite samples of similar weathering grades. Each grade gives a distinct range of indicator values.

Good statistical correlations were obtained between the petrographic properties of syenite and its physical and mechanical properties. These results were useful to construct a scheme to describe and classify granitic rocks under arid conditions.