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The tensile strength of the Zahedan Chehelkureh Copper Mine rocks with Brazilian and load test point methods

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Abstract: Engineering properties of rocks in construction projects, such as dam construction, road and tunnel construction, it is unavoidable. Determination of tensile strength such as dam building, the walls and ceiling of the tunnel will help a lot in stability analysis. Directly measure the tensile strength of the rock is costly and time-consuming. For this reason, the tensile strength of rocks is usually measured by indirect methods. Point load test and Brazilian test of accepted tests to determine the tensile strength of rocks. In this study, the tensile strength of the rock is studied by two methods. Chehelkureh Zahedan region as the sample was selected. Sampling and preparation of the core of the stones was mine. The microscopic sections of the samples were studied and tested to determine the uniaxial compressive strength, tensile strength and determination by time point using axial, diagonal and Brazilian tests were performed. The results show little difference between the results of axial and diagonal loading point there.

Key words: *Tensile strength; Brazilian test; Test time point; Mine Chehelkureh; Uniaxial compressive strength*

1. Introduction

Rock mechanics can be both theoretical and practical knowledge (applications) defines the mechanical behavior of rocks. with other engineering materials in terms of certain features of the physical, chemical, mechanical and hydraulic successive geological processes are influenced by the type and origin, is very different. Disconnect the ground and in-situ geological processes in the rocks (Husseiin 1387).

Analyzing the loads that are applied to the rocks, rocks, and you will help us to estimate the behavior of dozens of stone such failure and relocation assistance. So familiar with the physical and chemical properties of rocks and minerals are essential for development projects.

Understanding the physical properties, mechanical engineering and rocks engineering projects is the basic requirement. Although primarily on engineering projects, one of the most important parameters of uniaxial compressional resistance is required. But the tensile strength of rocks as well as one of the engineering properties of rocks, is important. For example, the tensile strength of the rock tunnel after a great influence on the stability of the tunnel. There are generally three methods for determining the tensile strength of rocks are determined by direct pull tensile strength of rock, Brazilian test time point, the last two as an indirect method to determine the tensile strength of rocks. Because of the difficulty and high cost of direct method to determine the tensile strength, usually indirect methods are preferred (Fahimifar and Soroush, 1380).

Copper ore zone CHEHELKUREH Zahedan, because of various rocks and tectonic forces at the regional and local scale has been selected for the study. This study compares the tensile strengths of rocks by two Brazilian tests Barnqth, and their effect on tensile strength properties of rocks have been fine. Also, this study investigated the impact of construction and tissue samples, and the rocks at the point load test results Brazilian and deals.

2. Geographical location of the study area

Chehelkureh copper deposit in south eastern Iranian province of Sistan and Baluchestan, Zahedan, in the order of 120 km North West longitude and latitude 60 degrees 7 minutes, 17 minutes and 30 ° are located. The average height of 1600 meters above sea level is. As Fig. 1 is observed to range from paved roads Zahedan bass is that the km 51 in the area called Tel Black-way to the north of the isolated, 25 km to the mining space and more garden entrance to the village, 44 km continues. CHEHELKUREH copper mine located 15 kilometers north of the village is that it is connected by a dirt road. Fig. 1 view of the geographic region of the province.

3. Geology of the study area

Big Khani fault (fault Neh the eastern branch, Neh) with the North - South and North-West-South-

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East fault CHEHELKUREH with the major faults in the region. Based on the geological map 1: 100,000 in the Vale and Said (1367) was produced (Fig. 2), rocks forming the studied area can be divided into three sections that from the perspective of age, from old to new are: ophiolitic melange, the younger sedimentary and igneous rocks of ophiolites.

Fig. 1: geographic location and routes of access to the copper deposit Chehelkureh

4. Microscopic studies (core and sections)

Several studies have shown that not only affect the physical properties of rock mineralogy and orientation of minerals in a rock sample, but also factors such as tiny cracks, these features are impressive (Raisanen 2004). Because of this section is devoted to the study of microscopic samples manually.

4.1. Samples Chehelkureh Zahedan

4.1.1. Siltstone

Particles of silt and veins filled with calcite, iron oxide, calcium carbonate is composed of quartz grains. The tissue has a relatively large fractures filled with quartz and certain Lamynasvn. Due to the high fracture resistance is low (Fig. 3).

4.1.2. Micrit (mudstone) calcareous; Y

The very fine grains of quartz and iron oxide, quartz and clay dough isformed (Fig. 4).

4.1.3. Grained sandstone; G

The fineness and veins filled with iron oxides, quartz, calcium carbonate, quartz and muscovite grains formed according to the forces have been severely broken. Considering the severe fractures and quartz grains crunch, poorly sorted, half round and the angle between the grains and their fine example of a non-resistant (Fig. 5).

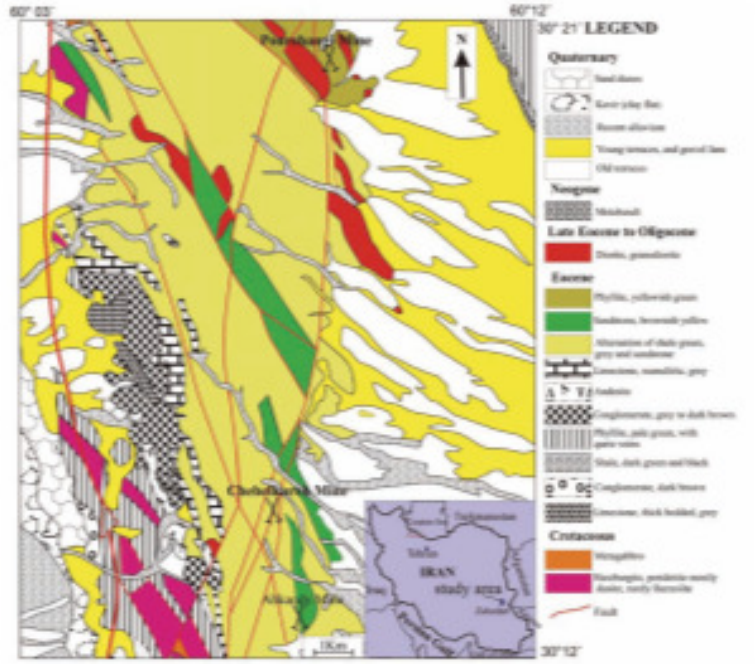

Fig. 2: Regional geological map CHEHELKUREH (Valeh and Saeed, 1367)

4-1-4 Rocks quartzarenite; A

Containing calcite cement, 10 to 15 percent chert, iron oxide and quartz grains that have been severely broken, is. In terms of texture and roundness are sorted medium and a half, the resistance according to the mean grain sorting roundness half grains, quartz rocks broken and there is also a nap in a low resistance (Fig. 6).

Fig. 3: siltstone

Fig. 4: Micrit (mudstone) calcareous; Y

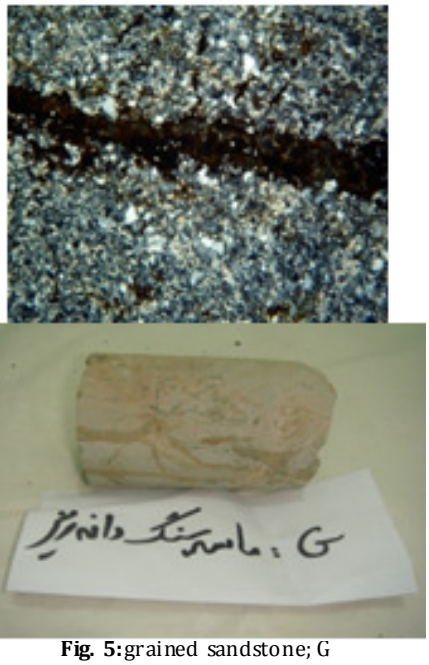

Fig. 5: grained sandstone; G

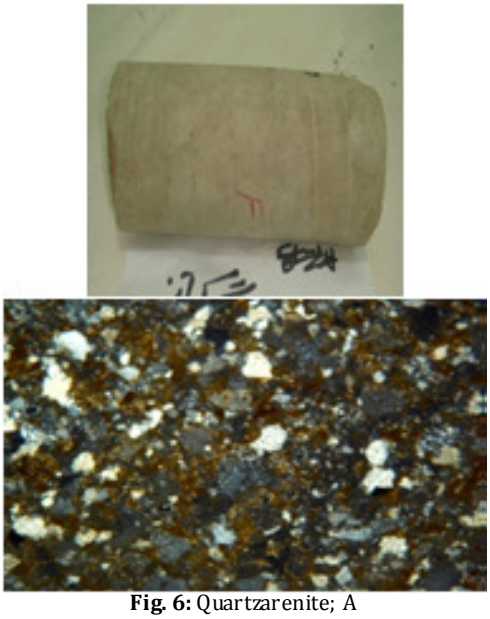

Fig. 6: Quartzarenite; A

4.1.5. chert Arenite; A1:

Containing 50% chert, silica and calcite veins filled with the texture of the sorting moderate to weak, half-rounded grains and is rarely rounded. Due to the presence of chert and quartz rocks of relatively high resistance (Fig. 7).

4.1.6. Quartzarenite, W; similarly, A1

Same sample A1, but chert of the samples A1, is less and therefore have less resistance (Fig. 8).

4.1.7. Calcareous sandstone containing mud sample H

Containing 50% alcohol and 50% quartz, calcareous and cement are calcareous. Which are sorted in terms of texture and rounded average middle. For resistance to the calcareous mud having a low resistance (Fig. 9).

4.2 Analysis of data

Properties of rocks mineralogical composition, texture (grain size and shape) woven (mineral makeup and pores) and is weathering (Ghobadi .2000, .Pacheco and Castro, 2006). Weathering of igneous rocks lacking because its mineralogical composition and texture, high resistance (Urban et al, 2004). The results of this study and other studies can be used to predict the properties of rocks Engineering geology of the study area should be used.

Tensile strength of rocks from the time point tested almost the same diameter. Except quartzarenite, w; the highest tensile strength, compressive strength for most of quartzarenite, w;

the other samples in less breakage of grains of quartz, calcite cement grains and sorting relatively better than it is.

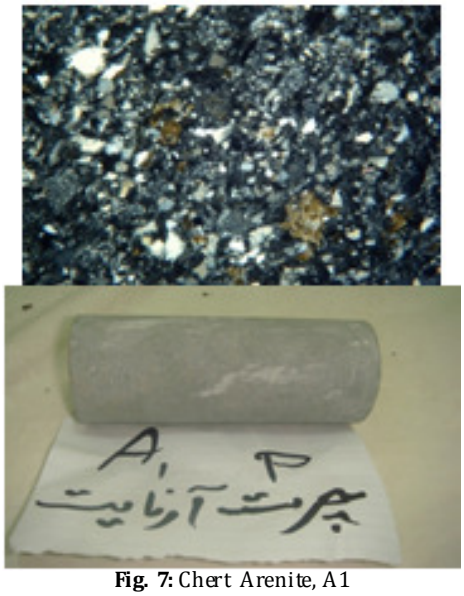

Fig. 7: Chert Arenite, A1

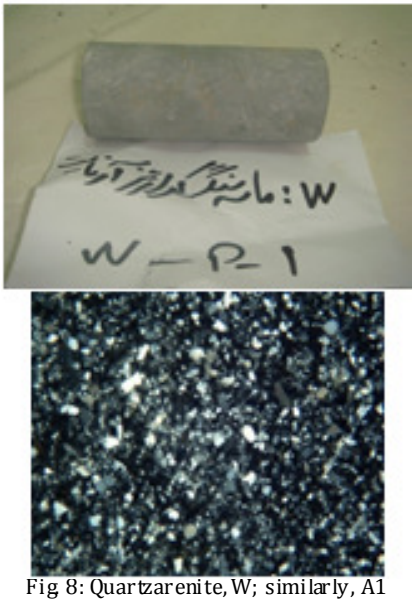

Fig 8: Quartzarenite, W; similarly, A1

Most samples of Brazilian tensile strength are relatively the same, except that the sample has a lower resistance than the other samples.

Compressive strength of rocks ore depends on the situation. The amount and type of cement in clastic rocks and igneous rocks or change the way the grain is important. Quartzarenite example, W; lacking compared to the other samples is weathered, more resistant.

5. Conclusion

There are streaks in the sand, fine-grained iron oxide causes the tensile strength of the samples show a greater reduction than the limestone samples.

Fig. 9: Calcareous sandstone containing mud, sample H

The change in resistance is always full of rocks does not comply with fine structures in rocks affect the outcome of the tests. In addition, the angle between the force and discontinuities in the rocks uniaxial tensile strength is important.

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