

SUMMARY

The aim of the thesis is to determine the levels of the physical and mechanical properties of chosen sedimentary (siliciclastic) rocks and also to describe their microstructural nature.

With respect to the intended use of the studied material (building stone raw material) the laboratory testing methods are presented. The samples were taken from the drill cores and also from the surface blocks in locality "Zlatý lom" Březín situated in western Bohemia.

The microstructural phenomena in the samples were studied using optical microscopy and digital image analyses. According to Folk's classification (1980) the name of the rock was lithic arkose.

The strength testing methods were represented by unconfined compressive strength and the Brazilian test. The rest of the mechanical parameters were determined in form of Young's modulus, shear modulus and Poisson's ratio. Special emphasis was given to the hydric expansion (after full immersion) test.

The other physical methods were used in order to describe the pore space and real density of samples. For this purposes the absorption test, mercury intrusion porosimetry and helium pycnometry were performed. Besides the porosity value, the pore-size distribution histograms were obtained.

In order to calculate the theoretical density of the rock MINLITH and MODES algorithms were used. Their calculations were based on the bulk analyses.

Potential connections among the individual properties were determined by the linear interpolation method with stated value of reliability.

The median values of drill core UCS ranged from 35 MPa to 52 MPa. The indexes of hydric expansion ranges from 0,28 ‰ to 1,90 ‰. The pore space values seemed to be dependent on the chosen procedure of determination. The lowest values were given by absorption and mercury intrusion porosimetry; whereas the highest values were calculated by algorithms.

Among the statistical findings, the connections between UCS of dry and wet samples seemed to be relatively significant. Another relatively high value of reliability was found in case of UCS and strength reduction ratio. There seemed to be a bigger influence of a porosity on the deformability, but smaller influence of the same parameter on the ultimate strength. All the linear correlations were significantly diminished after the samples were saturated.

The results presented in this thesis, the assessment of the methods and the statistical findings could be used as an initial framework in the durability assessment of the particular material.

Key words: physical properties, mechanical properties, petrology, mineralogy, arkoses, durability