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Abstract

The zubers (rock salts with clay matter content of 15-85%) are an important component of Permian salt domes and an interesting unit in the Zechstein evaporite sequence. These clay-bearing rock salt strata have variable proportions of salt to clay minerals. They have diverse chemical compositions, as well as structures and textures. Less attention was given to zuber rocks because of their high contents of clay matter which excludes them from being used as food or road salt. They were the subject of mineralogical, stratigraphic, and tectonic studies to determine their stratigraphic position within Zechstein evaporites. The main minerals in zuber rocks are halite and clay minerals, with admixtures including anhydrite, sylvite, carnallite, and a small amount of quartz, calcite, and iron compounds. Zuber rocks contain various chemical elements such as iron, magnesium, potassium, and bromine. Two types of Permian Zuber can be distinguished: brown and red zuber. Each type is characterized by diverse mineral composition and petrological features, including structure and texture.

These days increasing attention is paid to the geological and geomechanical recognition of clay-bearing rock salt as the potential underground storage site for fuel, energy, CO_2 or waste disposal. This article provides a synthesis of current knowledge about Permian zubers in Poland, with particular emphasis on their mechanical and physical properties, mineralogy, and geochemistry. Previous studies have shown that brown and red zubers formed in different cyclothems, thus differ in their composition and proportions of individual minerals as well as petrological features such as structure and texture. Moreover, individual zuber samples within the same formation or bed differ depending on the sampling location. The mechanical properties are influenced by petrological features. Therefore, the study of the relationship between mechanical properties and petrological features is necessary to ensure the safety of storage operations and potential use of zuber rocks in various fields. Previous research indicated that the properties of zuber rocks are comparable to those of rock salt, which is considered suitable for the storage of radioactive waste.

Key words: Zechstein zuber, rock salt, mechanical properties of Zuber rocks, storage potential