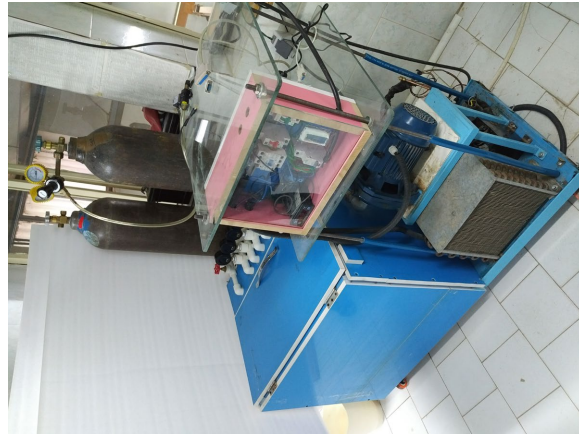


Assessment the behavior of two facies of a carbonate rock formation under various physicochemical conditions; a case study on the Taleh Zang Formation, west of Iran

MILAD TAHERI

Kermanshah Regional Water Authority

Presenting Author: milad.thr@gmail.com



This study aimed at evaluating the dissolution behavior of two facies of the Taleh Zang Formation in Kermanshah province, western Iran. This formation is a thick-bedded limestone with a total thickness of 176 m in the type section and dated as late Paleogene-early Eocene. These facies were deposited in shallow and deep waters. Employing an especially designed dissolution testing apparatus, laboratory experiments performed on the samples gathered from these facies to reveal their dissolution behaviors. While the results of laboratory testing showed that the specimens of both facies have similar physical and chemical characteristics, significant differences in their sedimentology characteristics, strength parameters, and karst development behavior were noticed. The tested samples showed distinct diagenesis states: the shallow facies mainly consisted of red algae and a highly variable percentage of the matrix (from less than 5% to more than 70%), the samples of the deep facies were mainly made of rock fragments with less than 2% matrix. These differences made considerable dissimilarities in the samples' dissolution behaviors and physical properties. Supporting this claim, the uniaxial compression strength of the deep facies samples was nearly 35% higher than samples of the other facies. Dissolution tests were conducted under three ranges of pH, three levels of hydrodynamic pressures, and two ranges of water temperatures. Results of dissolution testing showed that the sensitivity of Taleh Zang deep facies samples to the changes in pH levels (from pH=5.5 to pH=6.0) and variations in hydrodynamic pressures were 20% and 35% higher than the shallow samples, respectively. The specimens of both facies reacted similarly to the changes in the water temperature levels. Results obtained from this study showed that the deep facies of Taleh Zang Formation is more prone to karst development than the shallow facies. Such results can be highly useful in decision making processes concerning dam site positioning and the other water-related projects.