

Efficiency of Urea Hydrolysis by Ureolytic Bacteria under Saline Solvent Conditions

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ABSTRACT

Microbially induced carbonate precipitation (MICP) is a novel method for soil improvement producing carbonate-based minerals from urea hydrolyzed by ureolytic bacteria in the presence of divalent cation, especially calcium. Most MICP are experimented under fresh or deionized water, while salt water was not in the consideration of the MICP implementation. This paper investigated the efficiency of urea hydrolysis during the MICP reaction under different solvent and solute conditions. Deionized water, artificial salt water, and in situ sea water were used as a solvent. Several concentrations of urea and calcium ion were selected as a solute. The rate of urea hydrolysis by ureolytic bacteria was measured with time in the absence and presence of calcium source. The results showed that the efficiency of urea hydrolysis differed according to the recipes. Therefore, this batch-scale finding can be a reference for optimizing the MICP recipe under fresh and salt environments.

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