

Biomethanation under high salinity environment using a thermophilic hydrogenotrophic methanogen, *Methanothermobacter* sp. THM-1

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Hydrogenotrophic methanogen, which produces methane using hydrogen and carbon dioxide as electron donors and electron acceptors, is important for biological power to gas (P2G) technology that stores surplus renewable energy as chemical energy. In order for hydrogenotrophic methanogen to produce methane stably, high concentrations of ammonia and sulfide should be continuously supplied to the medium. It is possible that the salt concentration in the medium may be continuously increased due to the operating conditions in which high concentrations of ammonia and sulfide are continuously supplied to the medium. This increase in salt concentration inhibits methanogen growth and methane production. In this study, we isolated a new strain, *Methanothermobacter* sp. THM-1, which required a high salinity environment such as over 100 mM NaCl in the medium and high temperature, around 60 °C. By operating CSTR for approximately 1,500 hours, we maintained 70.9 L/L/d of methane production under high salinity condition.