

Biomethanation by a newly isolated Methanothermobacter sp. BS-16 for
'Power-to-Gas' process

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By increasing renewable electricity, surplus power from wind and photovoltaic generation may be used at a later time for load balancing in the energy grid. The combination of hydrogen with carbon dioxide can convert the two gases to methane using a biological methanation resulting in an interesting solution to store the electricity as CH₄ and, together, upgrade biogas to higher CH₄ content. Biological methanation, coupling the H₂, produced by water electrolysis, with the CO₂ and converting it to CH₄, has been conducted by hydrogenotrophic methanogenesis. Methanothermobacter sp. BS-16 was a newly isolated strain to perform the hydrogenotrophic methanogenesis from a thermophilic anaerobic digester in Japan. Methanothermobacter sp. BS-16 showed the excellent conversion performance on methanation (5.42 VVD) by using hydrogen and carbon dioxide with fast microbial growth rate under the optimum conditions of 60 °C and pH 7 ~ 7.2.