태양열을 이용한 바이오가스 내 메탄분해에 의한 수소 및 카본블랙 생산

김학주[1,†], 송경호[2,1]
[1]한국에너지기술연구원; [2]고려대학교
(hakjukim@kier.re.kr[†])

Biogas produced from municipal waste typically contains methane and carbon dioxide as main products. Since methane concentration in the biogas is generally around 50%, it is combusted as a fuel for heating or cooking. Combined with the removal process of CO2, methane can also be used in a gas engine to convert its energy into electricity and heat or compressed as CNG to power motor vehicles.
Since methane is combusted in the gas or motor engines, production of CO2 is inevitable. The thermal decomposition of methane (TDM) to hydrogen and carbon black using renewable energy is considered as a promising route to use efficiently the energy of methane without emitting greenhouse gas CO2. The carbonaceous solid product can be either sequestered without CO2 release or used as a valuable material commodity in different applications. It can also be applied as reducing agent in metallurgical
industry. The generated H2-rich gas mixture can be directly used as fuel for internal combustion engines or further processed to high purity H2 for being used in fuel cells.