

An economical process route to produce bio-LNG via CO₂ removal from biogas followed by liquefaction

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Bio-LNG supply chain mainly consists of CO₂ removal unit and then liquefaction process. Conventionally, CO₂ is removed through amines-based absorption, which consumes huge energy to regenerate the amines-based solvent. Similarly, liquefaction of bio-natural gas also uses the tremendous amount of energy in refrigeration cycle. Therefore, bio-LNG production is an energy and cost intensive process. In this context, we propose an energy efficient CO₂ removal through ionic liquid [Bmim][PF₆], by screening of leading candidates, rigorous regression and experimental validation of ionic liquids, followed by optimized energy efficient bio-LNG production process. This study was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2018R1A2B6001566), and by the Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189). This research was also supported by the Engineering Development Research Center (EDRC) funded by the Ministry of Trade, Industry & Energy (MOTIE; No. N0000990).