

Bio-hydrogen value chain: Enhancement in separation and purification step

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Hydrogen being a clean and green fuel for current and future energy systems in order to meet the energy shortage and environmental pollution crises. Renewable and non-renewable energy resources have been investigated for the production of hydrogen by efficient and economical processes. Renewable energy resources are considered to be sustainable and carbon less resources to produce valuable products, similarly, biomass processing has the potential to become the major hydrogen production path in the coming decades. Nevertheless, the bio-hydrogen contains a complex mixture of moisture, bio-methane, CO₂, CO, and N₂. In order to obtain high purity of hydrogen (99wt%), the separation and purification is one of the mandatory steps of bio-hydrogen value chain. Therefore, this study presents efficient and cost-effective enhancements in the purification step of bio-hydrogen value chain. Ionic liquid based absorption technology and cryogenic distillation are evaluated as potential candidates for the proposed enhancement. This research was supported by Basic Science Research Program through the National Research Foundation of Korea(NRF) funded by the Ministry of Education(2014R1A6A1031189).