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DAISHINKU CORP.

Improved KDS-DAC Which Combines CO₂ Capture with Hydrogen Generation

In April 2025, Daishinku Corp. (President: Minoru Iizuka) announced its initiative to develop the KDS-DAC CO₂ capture system, which is capable of capturing CO₂ affordably and providing a cost-effective approach to generate hydrogen, aiding the transition to a hydrogen economy. The details of the improvement achieved through development are provided below.

Details of the Improvement to KDS-DAC

KDS-DAC aims to reduce the costs of both CO₂ capture and hydrogen generation by recycling agents. In the latest improvement, the electricity cost for hydrogen generation has been reduced by approximately 35%.

The pre-improvement system captured CO₂ and generated hydrogen in the cycle of ① to ③ in the left panel of Figure 1. The improved system captures CO₂ and generates hydrogen in the cycle of ① to ② in the right panel of Figure 1.

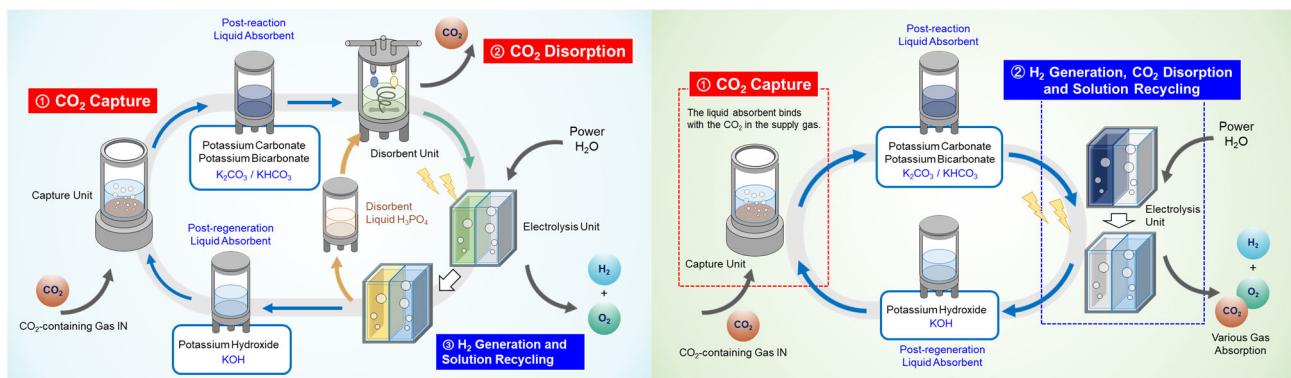


Figure 1: KDS-DAC before improvement (left) and after improvement (right)

Previously, KDS-DAC was designed to capture CO₂ by adding a disorbent. However, this process increased the energy consumption during electrolysis, resulting in higher running costs. To address this problem, the entire cycle was redesigned to eliminate the use of the disorbent and optimize the electrolysis conditions, leading to a significant reduction in power consumption.

Future Challenges for KDS-DAC

Discussions with companies have shown that they are interested in how to use and process captured CO₂, not merely the cost-effectiveness of capture technology. Daishinku Corp. will develop technologies that not only store captured CO₂ but also convert it into valuable resources, including methane. The company aims to advance R&D on solutions to valorize CO₂ in combination with capture technologies and build a circular business model encompassing capture, processing, and sale.

Creating a Sustainable Future with a Circular Business Model for CO₂ Capture and Hydrogen Supply

Amid an increasingly severe climate crisis, KDS-DAC is expected to reduce your carbon footprint while generating economic benefits. This technology will mark a first step toward carbon neutrality and a hydrogen economy. As an organization committed to making a genuinely positive social impact, Daishinku Corp. is strengthening partnerships with other companies to accelerate the rollout of KDS-DAC.

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