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To whom it may concern,

Chiyoda Corporation
IR, PR, & CSR Section

Hydrogen Transportation in the form of MCH by Chemical Tanker

Chiyoda Corporation (Chiyoda) is pleased to announce that the Advanced Hydrogen Energy Chain Association for Technology Development (AHEAD) has achieved a 'world first' milestone of transporting hydrogen, in the form of methylcyclohexane (MCH), overseas using a chemical tanker.

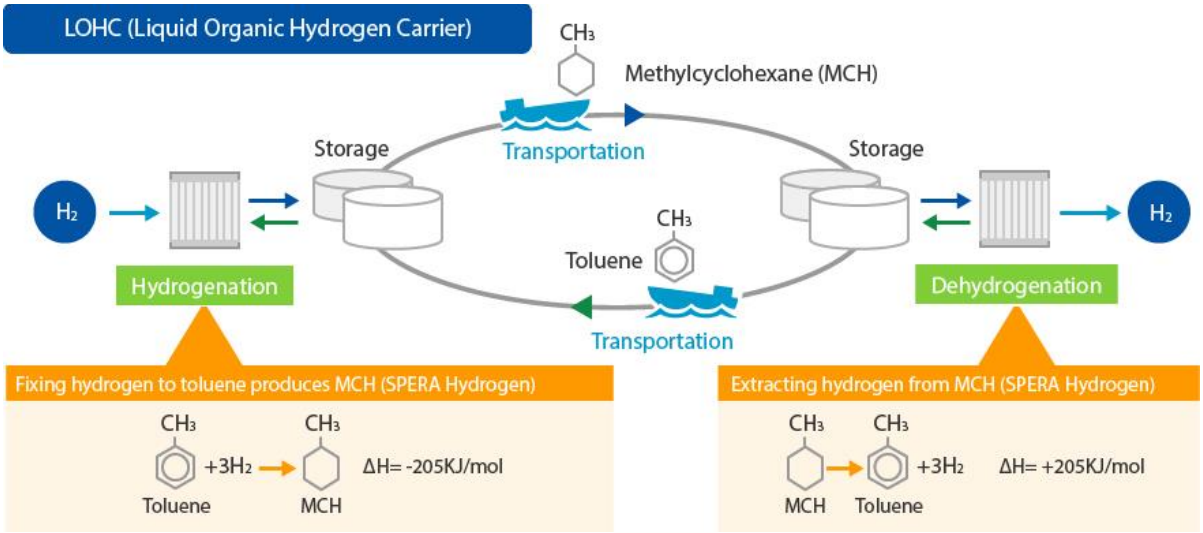
Chiyoda, as an associate member of AHEAD, manufactures MCH from toluene and hydrogen in Brunei Darussalam (Brunei), for transportation to an ENEOS oil refinery in Japan, using facilities constructed in Brunei by AHEAD, as part of their global hydrogen supply chain demonstration project, subsidized by the New Energy and Industrial Technology Development Organization (NEDO) and completed in December 2020[*1]. ENEOS uses the MCH for an ongoing demonstration project[*2], supported by the Consortium for Resilient Oil Supply System (CROS). The first chemical tanker[*3] arrived at the refinery receiving facility on 4 February 2022, via a transit port in Singapore where it was stored in existing outdoor storage tanks for several months before being loaded. The MCH will be fed into the refinery, which has a dehydrogenation function, to confirm the impact on its operation and to conduct a full-scale study of the quantity of MCH used.

This achievement demonstrates the viable long-term storage and transportation of hydrogen in the form of MCH on a global scale, essential for practical hydrogen transportation, and demonstrated that new capital investment is not necessarily a requirement as existing facilities can be used. An international supply chain that unleashes hydrogen's potential as a clean global energy solution, and the realization of a decarbonized society, is now a step closer.

AHEAD plans to increase production of MCH in Brunei for supply to ENEOS by chemical tankers until October 2022.

CRANE URANUS transporting MCH

*1: NEDO conducted a global hydrogen supply chain demonstration project from 2015 to 2020, using MCH as the hydrogen carrier in Chiyoda Corporation's liquid organic hydrogen carrier (LOHC) technology to transport hydrogen from Brunei to Kawasaki City in Japan's Kanagawa Prefecture.



*2: To strengthen petrochemical complexes, increase productivity, reduce CO2 emissions and meet cleaner operation requirements.

*3: AHEAD used 24-kiloliter ISO tank containers to transport MCH for their demonstration project in 2020 but will use larger 10,000 DWT class chemicals tankers for the ENEOS demonstration project to prove transportation commercial viability.

For further inquiries, please contact Tsukamoto/Ikejiri at the IR, PR, & CSR Section.
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