

August 1, 2023
Microwave Chemical Co., Ltd.
Chiyoda Corporation
Mitsui Chemicals, Inc.

**Joint Development of Innovative Naphtha Cracking Technology
"M-Cracker" Using Microwave Heating
Adopted by NEDO**

Microwave Chemical Co., Ltd. (Head Office: Suita City, Osaka; President and CEO: Iwao Yoshino), Chiyoda Corporation (Chiyoda Global Headquarters: Yokohama City, Kanagawa Prefecture; Chairman of the Board, President and CEO: Masakazu Sakakida), and Mitsui Chemicals, Inc. (Head Office: Chuo-ku, Tokyo; President & CEO: Osamu Hashimoto) have started the joint development of an innovative naphtha cracking technology using microwave heating.

In addition, this project has been adopted by the New Energy and Industrial Technology Development Organization (NEDO) under the "Program for Promotion of Research & Development and Social Implementation of Energy-saving Technologies towards Realization of a Decarbonized Society: Priority Issues Promotion Scheme. The three companies aim to commercialize the project by leveraging their respective expertise.

Currently, the domestic petrochemical industry emits 60.18 million tons of CO₂ annually of which 51.5% comes from ethylene plants. Ethylene plants, the starting point of the petrochemical industry, use fossil fuels for the pyrolysis of naphtha, and the CO₂ emitted from these plants is one of the challenges to achieving carbon neutrality.¹⁾ Therefore, fuel conversion to hydrogen and ammonia, which do not produce CO₂, and transition to electrification processes are currently being developed.

M-Cracker[®] developed by Microwave Chemical Co., Ltd. converts the energy source of the naphtha cracking technology, the basic chemical production process, to microwave heating. This will result in a new concept of cracking process that differs from conventional methods by directly heating the reaction field, which is a characteristic of the microwave process. Furthermore, the M-Cracker[®] will be further improved in near future by adopting the advanced catalytic naphtha-cracking technology, which has been developed by Chiyoda Corporation.

Mitsui Chemicals, Inc. is promoting various initiatives besides this project, aiming for carbon neutrality by 2050. There are high hopes for its application in the decomposition of alternative feedstocks to naphtha, such as bio-based raw materials.

Microwave Chemical Co., Ltd., which has expertise in scale-up of microwave processes, Chiyoda Corporation, which has extensive experience in EPC²⁾ business for ethylene plants, and Mitsui Chemicals, Inc. which operates the longest ethylene plant in Japan, will conduct joint development for social implementation to boost the profitability of ethylene plants from Japan to the world and carbon neutrality in the chemical industry.

1) "Carbon Neutrality in the Chemical Industry," Ministry of Economy, Trade and Industry

<https://www.city.shunan.lg.jp/uploaded/attachment/79293.pdf>

2) Abbreviation for "Engineering, Procurement and Construction. Engineering, Procurement and Construction.



[M-Cracker[®] logo]

【Thoughts on the M-Cracker[®] logo】

The arc line at the bottom of the logo is an image of the horizon, the world we live in. Naphtha cracking is the most fundamental technology in the chemical industry, and we hope to change the world with our microwave process.