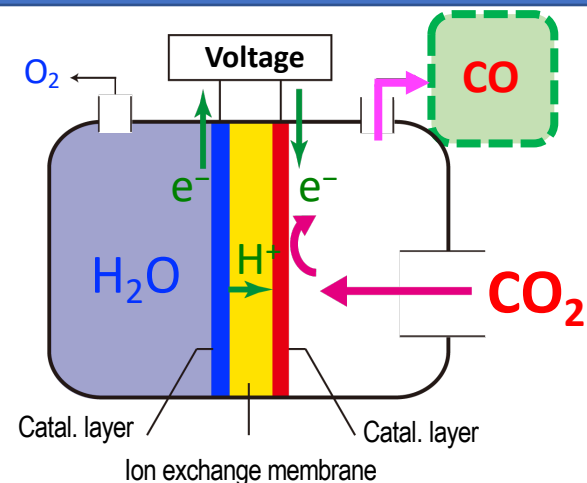


Catalyst Technology and Electrolysis Process for CO₂ Reduction

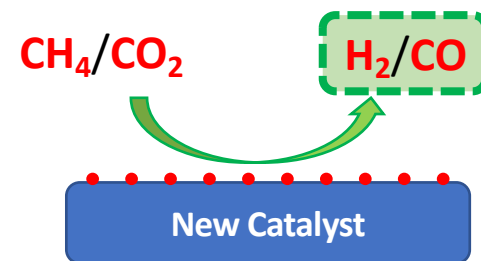
(1) CO₂ Electrolysis

Gas-phase CO₂ electrolysis is being studied as a CO₂ conversion method using renewable energy sources. The target products are useful molecules in the chemical industry like CO. Gas-phase electrolysis presents a high technological hurdle, but we have carried out research on this topic in collaboration with other institutions.



(2) Dry Reforming of Methane (DRM)

Our research focuses on the production of synthesis gas (CO and H₂) through the reaction of CH₄ and CO₂. This process allows for the simultaneous reduction of greenhouse gases (i.e., CH₄ and CO₂). Unlike conventional methods that require high temperatures (around 800°C), our laboratory has discovered an effective catalyst for low-temperature DRM.



(3) Electrification of Chemical Reactions

Conventional chemical reactions rely on the energy from the combustion of fossil resources, resulting in significant CO₂ emissions. In contrast, electrochemical reactions utilizing electricity from renewable sources can convert molecules with minimal CO₂ emissions. Our laboratory has developed an electrolysis device that enables the conversion of alcohols into value-added molecules.

