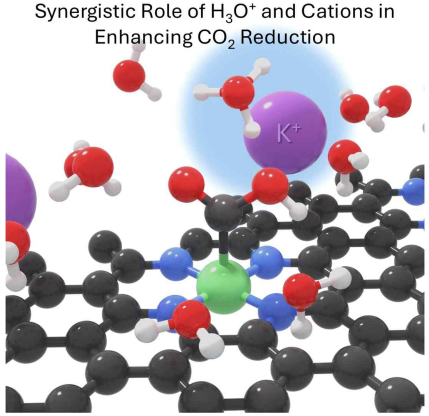


Research Outcomes	Strong Cation Concentration Effect of Ni-N-C Electrocatalysts in Accelerating Acidic CO ₂ Reduction Reaction
Performance Objectives	Published in a Top 10% JCR Journal
Type of Performance	<input checked="" type="checkbox"/> Research Article(Paper) <input type="checkbox"/> Patents <input type="checkbox"/> Researcher Exchange <input type="checkbox"/> Researcher Engagement <input type="checkbox"/> Information Exchange <input type="checkbox"/> Others
Description of Performance Type	Published in <i>Chem</i> (JCR top 3.5%)
Research Institutes	Seoul National University / Prof. Yun Jeong Hwang / Hyewon Yun et al. (7 others)
Attachments (Image, Photograph, Ect.)	<div style="text-align: center;"> <p>Synergistic Role of H₃O⁺ and Cations in Enhancing CO₂ Reduction</p>  <p><The interaction between the cation and H₃O⁺ stabilizes the reaction intermediate></p> </div>
Achievement Date	2025.03.05
Summary of Performance	<ul style="list-style-type: none"> - Development of Ni-N-C single atom catalyst which can effectively promote CO₂RR under acidic conditions. - Elucidation of strong cation concentration effect in strongly acidic electrolytes (pH<2). - The developed catalyst maintains a single-pass conversion efficiency of over 95% and a CO selectivity of over 90% for more than 50 hours in a membrane electrode assembly (MEA) system.
Description of Performance	<p>■ Key Features</p> <ul style="list-style-type: none"> - Development of Ni-N-C catalyst which can maintain high stability and selectivity in an acidic environment and investigation of its enhancement factor. <p>■ Performance</p> <ul style="list-style-type: none"> - MEA system maintained single-pass conversion efficiency (SPCE) of more than 95% and stable CO generation performance for a long time (more than 50 hours) in acidic conditions (pH 2). <p>■ Excellence of the Results</p> <ul style="list-style-type: none"> - Demonstrated that the single atom catalysts (Ni-N-C) can accelerate the acidic CO₂RR. - Suggested that the synergistic effect of cations and water molecules in the electrolyte improves the conversion rate of carbon dioxide. <p>■ Uniqueness of the Results</p> <ul style="list-style-type: none"> - Proposed a new advantages of Ni-N-C catalyst in an acidic environment. - Elucidated a synergistic effect of cations and water molecules through <i>in situ</i> spectroscopic investigations.