

Life cycle assessment of formic acid production using H₂ from power plant electricity and CO₂ from petrochemical company emission

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Many studies have been conducted to illustrate the production of formic acid (FA) utilizing carbon dioxide (CO₂) in an economically viable manner, but the environmental impact has not received much attention. When CO₂ is used to produce FA, greenhouse gas including CO₂ will be reduced although the economics of FA production utilizing CO₂ is lower than that of conventional production using fossil fuel. To achieve a sophisticated understanding of CO₂ utilization, this study focuses on life cycle assessment (LCA) for analyzing the environmental impacts of FA production. Based on new process simulation data for CO₂-based FA production, we compare the environmental impact results of CO₂-based FA to fossil-based FA. LCA has been conducted in consideration of five petrochemical companies located in the industrial complex of Korea to ensure the potential availability of sources.