Evaluation of CO_2 Reforming Process with KRICT Co Catalyst using LCA methodology

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When new products or processes are developed, it is very important to evaluate their environmental impact. Life-Cycle Assessment (LCA) is the one of useful techniques to assess environmental impact associated with all the stage of a product's life. We have been tried to perform LCA of CO2 dry reforming system using cobalt catalyst, which was newly developed in our center at KRICT. Removal efficiency of greenhouse gases and power consumption of the process including the separation process of syngas product were measured and analyzed by the simulation process and LCA methodology. In addition, the production process dimethylcarbonate (DMC), which are the useful chemicals that can be produced from methanol (Methanol was created from the syngas.), was included in our analysis. Aspen Plus was used for the simulation of each chemical process and the amount of greenhouse gases that can be generated or reduced during a process was calculated through 'classification' and 'characterization' techniques of LCA. In this result, it implies various chemical processes can be quantitatively compared through process simulation and LCA technique.