Simulation of the Process for Producing Butanol from Corn Fermentation

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ABSTRACT

This study focuses on the simulation of a complete process for producing butanol via acetone, butanol, and ethanol corn fermentation. The simulation, which begins with grain processing and proceeds through product purification, represents the first attempt to simulate such a complete process. Energy use for the production process is highlighted and compared to that for the conventional corn ethanol process. The simulation results are utilized in a lifecycle assessment for butanol as a potential transportation fuel. The lifecycle assessment study is conducted using the transportation full lifecycle assessment model, Greenhouse Gases, Regulated Emissions and Energy Use in Transportation (GREET), that has been developed by Argonne National Laboratory. A variety of key parameters are examined, such as the state of the art of the unit operations included in the process and their key process parameters, as well as their effects on the total energy consumption and greenhouse gas emissions in the lifecycle of butanol.