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U.S. Department
of Transportation



Title: Feedback Control of Gas Supply for Alcohol Production via Syngas Fermentation

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Project Goal

The project implements and tests a novel control method to optimize gas feed rate for production of ethanol and other alcohols from syngas via fermentation conducted by acetogenic bacteria. The method leverages advanced concepts of fermentation developed at OSU and uses common sensors and control equipment used in commercial fermentation.

The goal of the method is to optimize fermentation productivity, selectivity for the alcohol product, and conservation of energy from the feed gas into the product. This optimization is necessary to ensure process profitability.

Expected Outcomes

Our research is expected to further develop our knowledge of the hybrid gasification-syngas fermentation conversion of biomass to liquid fuel and chemicals. Models of fermentation will be extended to support design and control planning, and a specific method for automated control of fermentation will be developed. Implementation of the control algorithm in a commercial control system will allow stable operation of fermentation by moderately skilled personnel and promote expansion of commercial application. Expected outcomes include a patent and licensing in support of a growing industry that will serve an existing market over \$1,000,000 per day in Oklahoma and \$60,000,000 per day nationally for ethanol blending in motor fuel.



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