

In-Situ Extraction during Aerobic Fermentation to Raise titers of Bisabolene

Oleyl alcohol was applied in a 20-L test for continuous in situ extraction of bisabolene, a potential advanced biofuel precursor, in order to prevent product inhibition and improve titers. Emulsion and recovery issues, observed at this scale, were resolved.



Process Development of Three Novel High Value Fermentation Products S. Hubbard¹ F. Tachea¹, A. Narani¹, C. Chen¹, D. Melis², A. Alikhani², M. Ouellet², K. Hawkins², E. Gates², C. McSpadden², T. Mahatdjekul-Meadows², J. Dietrich, E². Steen², T.S. Lee³, D. Dugar⁴, T. Pray¹, and D. Tanjore¹ ¹Advanced Biofuels Process Demonstration Unit, Lawrence Berkeley National Laboratory, Emeryville, CA; ²Lygos, Emeryville, CA. ³Joint BioEnergy Institute, Emeryville, CA. ⁴Visolis, Berkeley, CA

The First Pilot-Scale Biological Production of Malonic Acid

Lygos, a company that developed a biological process for malonic acid production, provided us with fermentation parameters optimized at the bench scale. At the 300-L scale, we used a LabVIEW VI to control external pumps and regulate the progress of fermentation. The successful scale-up of this fermentation pathway demonstrated the ability in replacing traditional petroleum-based malonic acid production process, which requires hazardous cyanide and chloroacetic acid.







Figure 3. Scale-up Process Chain to emulate feeding strategy optimized at 2L scale



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Phosphate Limitation Allows for Higher Titers of a High Value Product

Cell density was accumulated and then held constant via substrate limitation to produce a high value chemical at high yields and titers. Further optimization of downstream recovery and catalysis of the chemical is ongoing. In these projects ABPDU was able to help take emerging technologies from bench to pilot scale and provide clients with enough products for downstream testing in commercial applications.



Figure 4. Cell growth is limited at 20h by full consumption of available phosphate. Product production continues unhalted

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Figure 5. Product rich

continuous centrifuge,

supernatant was harvested via



