



ADVANCED BIOFUELS AND BIOPRODUCTS PROCESS DEVELOPMENT UNIT

Emerging Fermentation Modes

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Gas Fermentation Development

Process development challenges:

- o Mass transfer
- Pressurization
- o Process safety
- Equipment availability
- o CRO / CMO availability

New capabilities:

- LBNL investment in 8 x 500mL and 20L gas fermentors
- BETO investment in best practices for process development and safety
- Pressurizable 3 atm
- Redundant safety controls



2019 ABPDU Industry Listening Day



7







Gas Fermentation Development



Checkerspot Pressurized Fermentations

Simulating manufacturing scale aerobic fermentation in pressurized miniature bioreactors



BioMADE.







Industrial Microbes ABF DFO

Ethanol: Bench scale *Current SOT – tech transfer*





Ethane: Bench scale



Ethanol : Pilot scale



Recommended strain and process improvements

Commercialization with ethane



Volatile Product Capture



- SAF and SAF precursors are often volatile, hydrophobic, and toxic
- Downstream separations challenged by volatilization and emulsion formation

RHO Renewables, Inc



- \circ $\,$ Lack mature technologies for volatile product capture
- $\circ~$ Xerogel-based capture in development with ANL
- \circ $\,$ Solvent stripping deployed as baseline technology $\,$





Volatile Product Capture

Off-gas capture with Amyris

- 300 L offgas capture campaigns at ABPDU for volatile terpene capture
- Production of high energy density jet fuel for fuel properties evaluation



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TCF project with Praj Industries

- Generation of 2,000 gallons DMCO for a business jet test flight via isoprenol or IPA
- Off-gas capture of isoprenol and isoprenyl acetate as intermediates













Continuous Fermentations





VISOLIS

W BIO

FERMENTATION

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ABPDU's Open Source Software Benefits Biotech Community

October 22, 2020 | By ABPDU



ABPDU Video SOP: Turbidostat VI Version 1.2 ABPDU Video SOP: Turbidostat Archiver Setup



Turbidostat operation at POW.BIO

Questions

What emerging applications should ABPDU prioritize?

How can ABPDU better identify and support early-stage technologies?

How can ABPDU better disseminate lessons learned from industry collaborations?











