

Fermentation

Bench-scale to pilot-scale capabilities for the conversion of biomass to sugars, fuels, and chemicals



Photo by Pat Corleary, NREL/PIX 16370

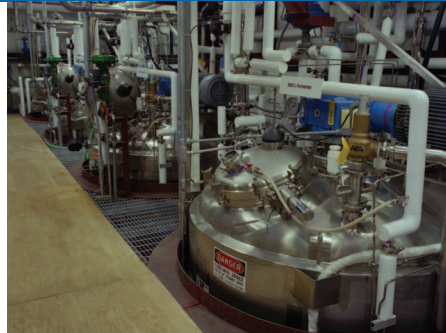
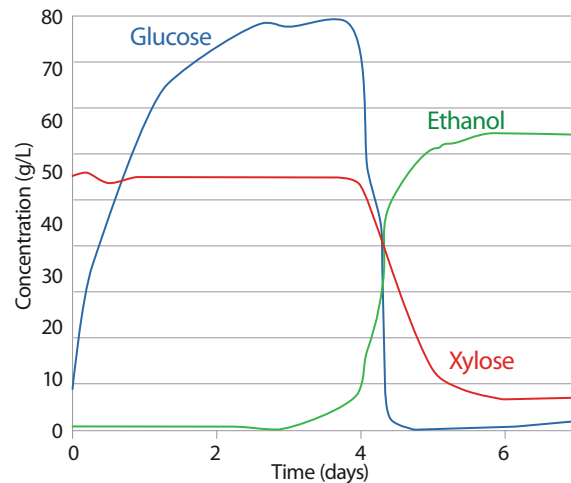


Photo by Warren Gretz, NREL/PIX 00945



Photo by Pat Corleary, NREL/PIX 16372



Enzymatic hydrolysis and fermentation of pretreated corn stover

Fermentation applications

- Enzymatic hydrolysis and fermentation testing
 - Different enzyme mixtures
 - Pretreated lignocellulosic feedstocks at low and high solids concentrations
 - Aerobic and micro-aerophilic cultivation processes
- Microorganism evaluation and development
 - Evaluating microorganisms for production of biofuels and bioproducts
 - Producing inhibitor-resistant and high-product-tolerant microorganisms for biofuels production
- Aerobic and heterotrophic algal process development
 - Studying the effect of the environment on algae growth and lipid production
 - Using algae residue as a feedstock for biofuels production

Bench-scale fermentation capabilities

- Fermentation systems with pH, temperature, and dissolved oxygen control
- Data acquisition and recipe control for the Biostat Q and Q-plus systems
- CO₂ and redox measurement capabilities
- At-line analytical equipment capable of monitoring glucose, xylose, ethanol, ammonium, and potassium ion with flexibility to measure other compounds
- Custom built bioreactor for high-solid lignocellulosic biomass slurries

Pilot-scale fermentation capabilities

- Multiple stirred bioreactor systems from 10 L to 100 L
- Two 160-L stirred vessels; two 1,500-L stirred vessels; four 9,000-L stirred vessels
- Feed and support vessels ranging in size from 100 L to 9,000 L