



Our Bioreaction blog tells the stories of our journey from the simplest to the most complex discoveries made by the Community BioRefinery that will change the way the world looks at 'carbon neutral world' – and how the Community BioRefinery seeks to 'feed and fuel the world'. Our Bioreactions involve a process that leads to chemical transformations from food to fuel and everything in between.

A "bioreaction" (in biochemistry terms) includes five types of general chemical reactions. They include: Combination synthesis; Decomposition; Single displacement; Double displacement; and Combustion. (Don't worry; there won't be a quiz...)

Community BioRefinery Products from Fermentation: Bio-Butanol

Bio-Butanol

The Community Bio-Refinery method of producing bio-butanol involves continuous flow fermentation, integrated as a component of our waste stream treatments.

Bio-Butanol can be used as a gasoline substitute in an internal combustion engine. It is a biochemical with a chemical footprint fuel more like gasoline than it is to ethanol. A C₄-hydrocarbon, butanol is a drop-in fuel and operates in automobiles as gasoline without modifications or adjustment to the engine or fuel system.

More important, however, is that our focus on bio-butanol is as the centerpiece for the Next Generation of Biofuels. With its unique properties, it will provide us with enhanced biodiesel fuel; bio-jet fuel; bio-aviation fuel- and more.

Bio-Butanol: The Next Big Biofuel

It's not new to the sustainable fuel scene. Some specialists would undoubtedly state that, traditionally, the fermentation of sugar-based feedstocks into butanol takes a back seat in relevance to ethanol. Such a perspective exhibits a deficiency of understanding of our history. Bio-Butanol plants ran in countless countries, including the USA, UK, China, Russia, South Africa, and India, during the initial two World Wars, particularly during WWII.

These plants were designed to harness the fermenting abilities of microorganisms to generate acetone from feedstocks such as molasses and corn starch. The acetone was used to make the creation associated with a process for the prep work of nitrocellulose gunpowder in which procedure acetone and alcohol solvent is utilized mixture. Nitrocellulose was gelatinized with natural solvents in creating gunpowder. Procedures are understood in which extremely unpredictable solvents are made use of for gelatinizing. Ethanol was generated in small amounts; however, the critical item of the fermentation was butanol.

Bottom Line: Bio butanol is cleaner, less caustic, and exhibits properties such as lowering the coagulation temperature of diesel fuel, enables greater power from diesel engines, does not require modification of fuel systems (like ethanol use does), and mitigates carbon emissions. It is truly an augmentation fuel - not an extender.

Butanol/Blended Bio-Esters via CBR

2nd Generation of Biofuels

- Zero petroleum requirement
- Zero price supports needed
 - Specialty corn/soy: will pay a premium to growers
 - Corn/soy not essential to process; many other feedstocks work well

- Fuels produced from sweet can sorghum vs. corn (greater sugar yield)
- Farmers growing sorghum will be paid same scale as #2 dent corn
- Local production/local consumption
- Revenues remain in local area
- MANY jobs (CBR): 600+, plus many indirect jobs
- Decentralized - Not competing with ADM/Cargill, etc.
- Zero pollution - waste stream turned into profit stream
 - Water at end of process recycled
 - Closed system so no air pollution
- Not sensitive to commodity pricing
 - Many different feedstocks can be used
 - Completely organic process
 - Many products from the MBR; not tied to commodity markets; multiple revenue sources from each MBR
- Revitalize rural America
- 10 MW of electricity generated from only waste (hydrogen)
 - Production plants are energy self-sufficient
- Up to \$100 million per year of economic impact to the area around the plant.