WHY BIO N-BUTANOL IS THE IDEAL INGREDIENT FOR COATINGS

Bio-based coatings ingredients have long been used to increase the sustainability profile of formulated products, but their inclusions have previously been thought to require performance compromises. Bio n-butanol from Green Biologics has been shown to have yield, kinetic, and other improvements in the synthesis of key coatings ingredients compared to their petrochemical counterparts. This results in a product that offers superior performance and improved economics. Plus, our bio n-butanol is decoupled from the volatile price swings associated with the petro-chemical market, making it a new, cost-effective, high-performing, sustainable alternative for coatings manufacturers.

100% bio n-butanol has demonstrated performance advantages in the synthesis of butyl derivatives

Green Biologics PriceLock program ensures pricing stability

Higher purity of our n-butanol translates to profitability

Supports sustainability initiatives through ingredient transparency and recognized certifications

Tailored and flexible service including technical support, logistics and consignment

The building blocks of better products.
Synthesis benchmarking proves the superior performance of bio n-butanol

To validate the utility of bio n-butanol as a high-performance building block for coatings materials, researchers at Green Biologics conducted a series of third party synthesis trials to benchmark bio n-butanol against petrochemical-derived n-butanol. They compared the performance of petrochemical and bio-based n-butanol in direct Fischer esterification and transesterification reactions.

For the Fischer esterification, we studied the production of n-butyl acetate and n-butyl acrylate, which represent greater than 60% of the global market for derivatives (Source: IHS). Over multiple runs, the bio n-butanol was able to show a 3.4% yield improvement in butyl acrylate synthesis and a 4.3% yield improvement in butyl acetate synthesis. In addition, the reaction kinetic rate constant for n-butyl acetate synthesis was 5% higher when using bio n-butanol.

Transesterifications of methyl methacrylate to n-butyl methacrylate showed a significantly higher yield (+ 10.7%) and rate constant value (+ 8%) for bio n-butanol over the petrochemical equivalent. Higher yields translate into more product, less waste, and improved downstream purification. Better kinetics can offer catalyst and energy savings or the ability to lower fixed costs by boosting throughput of existing assets.

In addition to having a higher conversion of the desired end product, the lower level of impurities at the end of the reaction often equates to easier downstream purification, increasing overall product yields, removing process steps, and reducing waste. Yield, impurity, and kinetic data in direct esterification and transesterification are superior, making our bio n-butanol a logical choice for synthesis of butyl derivatives.

Sources: Tetramer Technologies LLC, The ChemQuest Group Inc., Green Biologics

Notes:* Average of 3 reactions for each butanol source
† Concentrations of reaction components by GC-FID, average of 3 reactions with petro-butanol and 5 reactions with Green Biologics bio n-butanol
‡ % end product in reactor at end of synthesis determined by GC-FID
† ‡ Concentrations of reaction components by GC-FID, average of 3 reactions with each butanol source