



Biomass-derived Butadiene from Tetrahydrofuran

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THF to Butadiene

A new process uses a novel catalyst to synthesize butadiene in high yields from biomass-derived tetrahydrofuran (THF). Butadiene is made by contacting THF (or a THF derivative or combination thereof) with a heterogeneous acid catalyst to yield a diene. This new P-based heterogeneous catalyst, which is highly efficient at converting furans to dienes, performs dehydro-decyclization of tetrahydrofuran (THF) at elevated temperatures and achieves conversion of THF to butadiene with selectivity approaching 98%.

High Yield Butadiene from Biomass

Butadiene, while traditionally produced from petroleum, can also be produced from biomass, including bacterial production from renewable substrates. However, these production methods suffer from low overall yields or low conversion rates, which prevent them from being economically feasible. In addition, conventional catalysts cannot operate at high selectivity. This new catalyst achieves high selectivity to dienes and produces butadiene from a biomass-derived precursor at a high yield. Using a less expensive precursor is not only economically viable, but economically competitive with current petroleum processes.

BENEFITS AND FEATURES:

- Biomass-derived precursor
- One-step dehydro-decyclization of THF to butadiene
- High yields (up to 98%)
- Catalyst technology
- Does not use fermentation
- Better selectivity and yield

APPLICATIONS:

- Butadiene synthesis
- Butadiene manufacture from biomass

- Diene synthesis from biomass vs petroleum-based
- Tires
- Rubber products such as styrene butadiene rubber (SBR), polybutadiene rubber (PBR), nitrile rubber (NR) and polychloroprene (Neoprene)
- Acrylonitrile butadiene styrene (ABS) plastic

Phase of Development - Proof of concept

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Publications

[*Biomass-Derived Butadiene by Dehydra-Decyclization of Tetrahydrofuran*](#)

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