

Written on 15 December 2021 2 minutes of reading

News

Innovation and Industry

Renewable energies | Bio-based chemistry

Anellotech's Bio-TCat™ technology for making Bio p-xylene, toluene and benzene from woody biomass is ready for commercialization

Partner Suntory used Bio-TCat p-Xylene to produce a 100% bio-based PET plastic bottle, as the last step in the Anellotech, IFPEN, and Axens joint-development program

100% bio based, polymer-grade p-Xylene produced in Anellotech's TCat-8® pilot plant has been used by Suntory, a global consumer beverage company, to make 100% bio-PET resin and successfully produce prototype PET beverage bottles, as announced by the company on

Dec.3rd 2021.

Production of bio-PET, starting with bio p-Xylene from the Bio-TCat™ technology of Anellotech through the subsequent downstream separation, purification, intermediate PTA (purified terephthalic acid) and final PET steps, was the last milestone to completely validate the Bio-TCat™ technology for the production of prototype 100% bio-based bottles. This follows more than 5000 hours of successful TCat-8® pilot plant operation using pine wood feedstock to produce tonnes of BTX aromatics. To date, enough of the produced bio paraxylene was separated to allow potential production of more than five thousand (5000) 100 % bio-based Plastic 500 ml bottles, while fully meeting polymer grade specifications.

This achievement by Anellotech and its joint process development alliance partners, IFPEN and Axens, affirms their commitment to innovative production of cost-competitive renewable chemicals. Anellotech also partnered with Johnson Matthey for the Bio-TCat catalyst development. Anellotech's TCat-8® pilot plant, built to develop the Bio-TCat™ technology, demonstrates the performance of this efficient thermal-catalytic process which converts non-food renewable biomass feedstocks into aromatics. The Bio-TCat™ process will enable aromatic chemical producers and brand owners to meet environmental, sustainability product goals, due to its low carbon footprint and its non-food renewable biomass feedstock. Bio-TCat™ benzene can be used to make a range of bio-styrenics, nylon, and polycarbonate, while Bio-TCat™ toluene can be used for production of polyurethanes. Discussions are underway by Anellotech and its exclusive licensing partner Axens to commercialize the Bio-TCat Process, by identifying potential partners (including off-take) and a plant location for a first 500 tonne/day feed
rate commercial plant. A "white paper" process design package has already been completed by Axens for adaptation to the actual plant site, once selected.

> "The competitive advantage of Anellotech's Bio-TCat generated paraxylene is its process efficiency (it uses a single-step thermal catalytic process by going directly from biomass to aromatics (benzene, toluene and xylene)), as well as the opportunity it creates for a significant reduction in greenhouse gas emissions as compared to its identical fossil-derived paraxylene in the manufacture of PET, especially as it generates required process energy from the biomass feedstock itself" said David Sudolsky, President and CEO of Anellotech.

> "We are extremely glad to announce this major step of our common development that fits in our goal to develop new technologies and products for a low-carbon economy. It shows that Bio-TCat BTX products can be used to make key polymers answering the needs of brand-owners for sustainable products and opening the road for sustainable processes to produce the main chemical intermediates " said Jean Pierre Burzynski, Process Business Unit Director at IFPEN.

> “I am delighted to announce this major achievement. It validates the bio-paraxylene produced by the Bio-TCat process showing the growing interest of the market for sustainable products and opens the way for the realization of the first commercial plant. This is part of our strategy to accelerate the deployment of bio-based products and to reduce substantially the GHG emissions of the chemicals value chain. ” said Pierre Beccat, CTO of Axens.

More Information

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About Anellotech

Founded in 2008, Anellotech (http://www.anellotech.com) is a sustainable technology company focused on commercializing the innovative production of cost-competitive renewable chemicals and fuels from non-food biomass or waste plastics. Its patented Bio-TCat™ technology is an efficient thermal catalytic process for converting biomass into benzene, toluene and xylene, which are chemically identical to their petroleum-based counterparts. In addition to BTX, Bio-TCat™ technology produces heavier aromatics AnelloMateTM”, which can be used to make high-quality biofuels blendstock for transportation fuel to help decarbonize transportation fuels supply chains. Engineering work to design the first commercial plant is underway by Anellotech and its R&D, engineering and licensing partners IFPEN and Axens.
www.anellotech.com

About IFPEN

IFP Energies nouvelles (IFPEN) has collaborated with Anellotech since 2014 to leverage its expertise in fluid bed catalytic reactor technology, refining and petrochemicals processing and aromatics processing. In addition to extensive activities at its R&D center in Lyon, France, IFPEN has provided technical experts to work for several years at Anellotech’s Texas location during the start-up and operations of the TCat-8® development unit.

About Axens

Axens is an international provider of licensed advanced technologies, catalysts, adsorbents and services to the petroleum refining and petrochemicals industries, which has a global reputation for engineering design excellence and licensing in the production of aromatics. Globally, 45% of all refineries have at least one Axens technology license. - www.axens.net

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