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New biobased building blocks for health sciences and biomaterials

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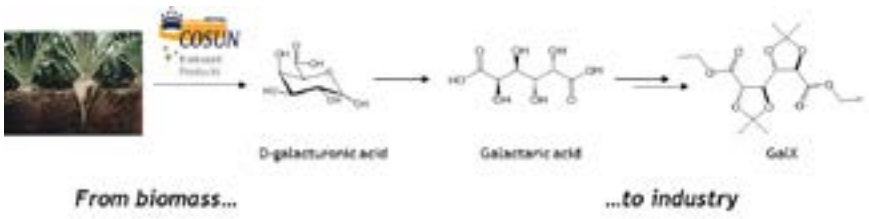
Cosun biobased products (CBP) offers biobased solutions. The activities range from development to manufacturing and supply of biobased functional chemicals. Within Cosun R&D and CBP, we have developed a biorefinery concept on sugar beet pulp. Within this flexible concept, we are able to isolate cellulosic fibers, and different monosaccharides. One of the key monosaccharides is D-galacturonic acid. Using mild processing conditions, galacturonic acid can be isolated and selectively oxidized to galactaric acid (commercial name: mucic acid). This molecule has multiple outlets including health sciences. It offers unique functionalities, which are already used in pharmaceutical applications (for example isometheptene mucate). For higher volume outlets, biomaterials can be made using galactaric acid as an intermediate to GalX. This novel platform building block shows new opportunities to polymers and crosslinkers. In shared research with universities, GalX shows good Mw, Tg and E modulus compared to industrial benchmarks. Besides these parameters, the improved water solubility compared to adipic acid is an unmet market need for new formulations.



Recent Publications

1. Gavrila I, Raffa P and Picchioni F (2018) Acetalised galactarate polyesters: interplay between chemical structure and polymerisation kinetics. Polymers (Basel) 10(3):248–267.
2. Wróblewska A, Bernaerts K and De Wildeman S (2017) Rigid, bio-based polyamides from galactaric acid derivatives with elevated glass transition temperatures and their characterization. Polymer (Guildf) 124:252–262.
3. Van der Klis F, Gootjes L, Van Haveren J, Van Es D and Bitter H (2018) From batch to continuous: Au-catalysed oxidation of D-galacturonic acid in a packed bed plug flow reactor under alkaline conditions. Reaction Chemistry & Engineering 3:540–549.
4. Wróblewska A, Bernaerts K and De Wildeman S (2018) In-depth study of the synthesis of polyanalysis in the melt using biacetal derivatives of galactaric acid. Polymer degradation and stability 151:114–125.

Biography

Robert Lazeroms is a Specialist in Organic Chemistry. During his industrial career, he worked within the medicinal chemistry department (2000 - 2008) of Organon in Oss, where innovative chemistry is key issue to develop new medicines. From 2008 – 2012, he worked within Organon/Merck MSD within the active pharmaceutical ingredient (API) department, in the field of troubleshooting related to the production activities of API's. In 2012, he started as a Technical Project Leader within Royal Cosun to set up R&D activities for the valorization of galacturonic acid from sugar beet pulp. Besides his work at Cosun, he is a part time researcher of the Avans Biopolymer group in Breda.

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