

// CHEAP AND PURE PRODUCTION OF D-XYLONATE

Ref-No: TA-PT1.2754

BACKGROUND

With our technology it is possible to achieve 100 % enantiomerically pure d-xylonate, proceeding from d-xylose as substrate. A high yield of up to 0.9 grams per gram of substrate can be achieved. In contrast to state of the art production strains the production of d-xylonate with modified *C. glutamicum* is much easier and cheaper. This makes the invention interesting for use in various industries with strict approval requirements and high cost pressure.

Forschungszentrum Jülich has extensive expertise in the field of bioprocess development and holds several patents. The main focus of the Institute of Bio- and Geosciences (IBG-1) – Biotechnology - lies in the analysis and improvement of industry relevant biotechnological processes. The here described technology has been approved in lab-scale bioreactors (1 L) during batch and fed-batch cultivation. The yield matched the theoretical maximum of 1 mmol d-xylonate per 1 mmol d-xylose. Without any further process optimization a titer of 35 g L⁻¹ and a space-time-yield of 4 g L⁻¹ h⁻¹ was reached. Therefore, a highly profitable bioprocess to produce d-xylonate from d-xylose or from lignocellulosic biomass as cost-efficient second-generation substrate is feasible.

We are continuously seeking for cooperation partners and/or Licensees in this and adjacent areas of research and application.

PROBLEM

State of the art production strains need complex media and a number of necessary process steps for product preparation to obtain pure d-xylonate. Preferentially, the applied production organism is not genetically modified (non-GMO) to enable its application in pharmaceutical, food and chemical industries.

SOLUTION

The invention features an economic and convenient way to produce enantiomerically pure d-xylonate from d-xylose without the use of genetically modified microorganisms. The complexity of the media used is low, thus reducing the number of necessary process steps for product purification.



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DEVELOPMENT STATUS

Laboratory model

CATEGORIES

//Life Sciences //White biotechnology

SCOPE OF APPLICATION

d-xylonate is a C5 sugar acid with the potential of being a relevant chemical building block in a future bio-based economy. The largest potential lies in its proposed capability to replace or complement d-gluconate, which is currently produced at a scale of 100,000 t per year and finds numerous applications in the production of pharmaceuticals, food, solvents, dyes, concrete and other products.
