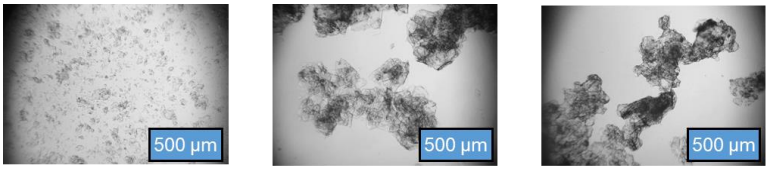
Downstream processing of L-Tryptophan

Efficient preparation and purification of L-Tryptophan

Invention

L-Tryptophan is an essential amino acid, which e.g. is used as dietary supplement, as food additive and as a pharmaceutical. The synthesis is possible in different ways. A prominent method for its preparation is the biotechnological fermentation with microorganisms.



a) Aqueous solution b) 26 W-% 1PrOH c) 20 W-% iPrOH

Tryptophan crystals after cooling crystallization in different solvents.

The prepared raw Tryptophan still includes impurities and has therefore be purified before it can be used in the described areas.

Known purification methods use the crystallisation effect of Tryptophan under change in the pH. In order to use this method, the fermentation broth has first to be treated with sulfuric acid to reach a pH below 2 and then the pH has to be raised rapidly by using e.g. sodium hydroxide to end at a pH around 6-8.

This process has several disadvantages. Besides the loss of acid and base in high volumes, the usage and combination of both come along with corrosive processes. Therefore, the construction and equipment has to be selected with respect to this. The corresponding salts have to be removed in washing steps from the crystals, too.

The presented invention here avoids the usage of acids and bases and uses specific alcohols in a cooling process instead. The proof of principle has been shown in a batch and also continuous processes.

The combination of process steps as solving of the product, reduction of solvent and cooling of the broth can be varied and show different effects of the characteristics and accessible yields of Tryptophan.

Commercial Opportunities

PROvendis is offering licenses for the invention to interested companies on behalf of the Technical University of Dortmund. There is also the possibility of collaboration with the inventor.

Current Status

In case of interest we are pleased to inform you about the current patent status.

Relevant Publication

Hohmann, L. et *al*. (2016) Design of a Continuous Tubular Cooling Crystallizer for Process Development on Lab-Scale. *Chem. Eng. Technol.* 39(7): 1268-80 doi.org/10.1002/ceat.201600072

An invention of TU Dortmund.

Competitive Advantages

- Acid and base free purification of Tryptophan
- Easy handling of solvents
- Up to 90% recovery
- Reduction of waste material
- Varied crystals under specific conditions

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