

Technology Offer

Acidophilic Enzymes – Glucosidases and Esterase

Reference Number
TO 02-0096

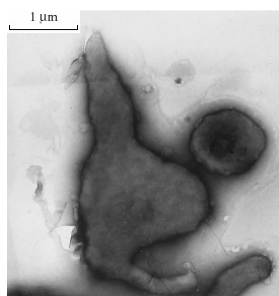
The Challenge

Enzymes like Esterases and Glucosidases are used for several different industrial purposes. Esterases can serve e.g. as laundry detergent additives or biocatalysts for the synthesis of enantiomerically pure compounds. The spectrum of applications for glucosidases has widened in many fields like clinical, medical, and analytical chemistries, as well as their wide spread application in starch saccharification and in the textile, food, fermentation, paper, brewing and distilling industries.

The major obstacles limiting the application of microbial enzymes generally are low catalytic activity under the specific, partly extreme process conditions, missing selectivity, low thermostability and high manufacturing costs. But the tremendous commercial potential of microbial enzymes in a variety of applications remains the driving force for research in this area.

The Technology

We offer four novel enzymes obtained from the acidophilic ferrous-iron-



Ferropasma acidiphilum
Source: Pivovarova et al. (2002)

oxidizing archaeobacterium *Ferropasma acidiphilum*. The enzymes are active and stable at extremely low pH between pH 2 and 3 and use iron Fe²⁺ as co-factor for activity. Three of these novel enzymes are glucosidases, one of them being an α -glucosidase with very strong transglycosylation activity. Besides that we offer one acidic esterase showing high enantioselectivity having further unique characteristics.

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Commercial Opportunity

As the offered glucosidases and the esterase have several advantages compared to commonly used representatives of these enzymatic groups they commercially have a great potential. Advantages are:

- low pH-optimum useful for specific applications
- high stability at low pH
- high specific activity
- easy production by fermentation
- low costs of production
- increased product quality by high selectivity

Patent situation

European patent application was filed in March 2005 (EP 05 101 628). The international application has been published WO2006/094943.

Further Reading

A novel α -glucosidase from the acidophilic archaeon, *Ferropasma acidiphilum* strain Y with high transglycosylation activity and an unusual catalytic nucleophile. Ferrer M, Golyshina OV, Plou FJ, Timmis KN, Golyshin PN. *Biochem J.* (2005) Jun 7.

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