

PRESS RELEASE

Vogelbusch optimises important aspect of the bioethanol production from woody raw materials

Vienna, 26 March 2008. Vogelbusch GmbH has applied for a patent for a fermentation process that boosts the efficiency of bioethanol production from raw materials containing hemicellulose. A key feature of the process is an improved strain of microorganism, which delivers high yields in the production of bioethanol from materials that contain hemicellulose, such as wood waste. In the future, this strain will enable bioethanol to be commercially produced from alternative raw materials, thereby improving the CO₂ balance of alternative fuels.

Vogelbusch GmbH, which is based in Vienna (Austria), today announced that it has applied for a patent for an efficient fermentation process for the high-yield extraction of bioethanol from materials containing hemicellulose. Working in partnership with the Institute of Biotechnology and Biochemical Engineering at Graz University of Technology, the company has succeeded in extracting significantly more ethanol from this raw material than other processes.

The new process aims to boost the ecological and economic efficiency of bioethanol production from alternative raw materials such as wood waste. Although the extraction of bioethanol from these types of raw materials is, in principle, feasible and offers attractive ecological benefits, current practices have thus far only produced small yields of the desired end product. The development from Vogelbusch GmbH significantly contributes to the cost-efficiency of bioethanol produced from hemicellulose-containing raw materials.

Dr. Gottfried Sodeck, CEO of Vogelbusch GmbH, comments on the importance of the patent: “Our research department has been working closely with Graz University of Technology for a number of years. The process for which we have now submitted a patent application is the direct result of this cooperation. It enables wood waste to be converted into ethanol far more efficiently and, as a result, it will significantly boost the development of biofuels made from lignocellulose. Thanks to our extensive experience in the production of bioethanol from sugary and starchy raw materials and our outstanding track record in this area, Vogelbusch has succeeded in taking an important step forward in expanding the raw material base for its bioethanol production process.”

The aim of the research was to optimise the process that converts the carbohydrate xylose into ethanol using the yeast *Saccharomyces cerevisiae*. Xylose is a key intermediate in the production of bioethanol from wood waste, but production processes based on this material are

usually relatively inefficient. The reason for this is the imbalanced availability of the substances NAD and NADP – which function as co-enzymes during the conversion process and transfer hydrogen groups – in the majority of microorganisms. The optimisation work that Vogelbusch has carried out on *S. cerevisiae* resolves the issue of co-enzyme imbalance, thereby delivering greater efficiency in the conversion of xylose into ethanol. The following specific adjustments have optimised *S. cerevisiae*:

- Introduction of the capacity to synthesise a form of the enzyme xylose reductase with an altered binding site for certain co-enzymes.
- Introduction of the capacity to synthesise the enzyme xylitol dehydrogenase from *Galactocandida mastotermitis*.
- Introduction of the capacity to synthesise larger volumes of the enzyme xylulosekinase.

The increased efficiency levels in xylose-based ethanol production thus achieved also help to lower the production of unwanted by-products such as glycerine and xylitol. As a result, this optimised strain of *S. cerevisiae* is able to produce greater ethanol yields than other previously used strains.

However, representatives of Vogelbusch GmbH are not just pleased with these immediate results: “This increase in yields is an important step that has come at just the right time. Although the first pilot plants for bioethanol production based on raw materials containing hemicellulose are already in place, efficiency levels fall short of what will be possible in the future. Vogelbusch GmbH is carrying out ongoing research and development to ensure that we can meet our customers’ expectations regarding the efficiency of our plants, and are able to satisfy the growing demands that society is placing on the environmental benefits of biofuels.”

About Vogelbusch GmbH (as at March 2008):

VOGELBUSCH GmbH plans and implements global production facilities for biotechnological processes. Customers include starch and sugar processing companies and the biopharmaceutical industry. VOGELBUSCH is a leading international technology supplier for bioethanol plants. The company is based in Vienna (Austria), was founded in 1921 and is privately owned. It employs a total workforce of 110 and has subsidiaries in Houston, Texas (U.S.) and Hong Kong (China).

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