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Pioneering viscometry since 1972

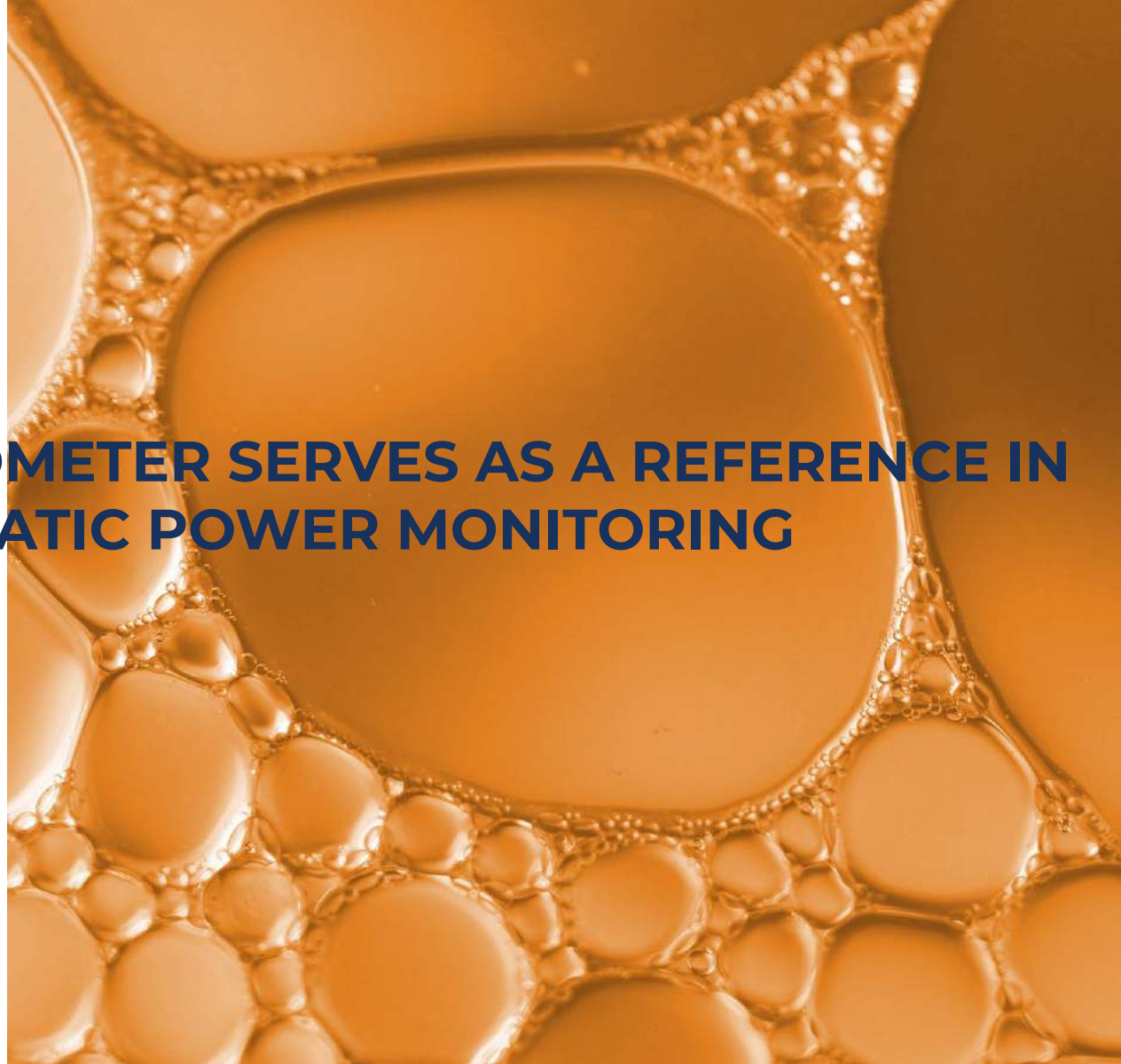
Business Case

Enzymes

HOW VISCOMETER SERVES AS A REFERENCE IN THE ENZYMATIC POWER MONITORING

Measurement of the enzymes activity is a key challenge for this leader in Biotechnology

novo nordisk



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CHALLENGE

This global biotechnology company is a leader of production of industrial enzymes, micro-organisms and biopharmaceutical ingredients.

Cellulases are the enzymes that break down cellulose, the main component of plant cells and wood. They have many applications including those in pulp and paper and in detergents in which they help to decrease the pilling.

An efficient technique for measuring the activity of the cellulase solution is necessary to control the manufacturing process and ensure the final quality. The technique known as DNSA method, based on the reduction in the viscosity of a CMC solution in contact with the enzyme is one of the most effective but requires a viscometer whose performance is commensurate with the challenge.

United States Patent [19]
Lund et al.

[11] **Patent Number: 5,916,798**
[45] **Date of Patent: Jun. 29, 1999**

[54] **METHOD OF OBTAINING A CELLULOSIC TEXTILE FABRIC WITH REDUCED TENDENCY TO PILLING FORMATION**

[75] Inventors: **Henrik Lund**, Copenhagen; **Hanne Høst Pedersen**, Lyngby, both of Denmark

[73] Assignee: **Novo Nordisk A/S**, Bagsværd, Denmark

[57] **ABSTRACT**

A method for obtaining a cellulosic textile fabric having a strongly reduced tendency to pilling formation, preferably corresponding to a pilling note of at least 4, more preferably of at least 4.5, which method comprises treating the fabric with a cellulase capable of performing a partial hydrolysis of the fibre surface corresponding to a <2% weight loss based on the untreated cellulosic textile fabric. The cellulase is preferably a 43 kD endoglucanase derived from or producible by *Humicola insolens*, DSM 1800, SEQ ID NO:1, or a functional analogue of said cellulase such as a variant which is modified by substitution of one or more amino acid residues in one or more of the positions 8, 55, 58, 62, 67, 132, 147, 162, 221, 222, 223, 280; or modified by truncation, preferably genetically truncation, at any position from position 213.

Extract

MIVI Viscometer key features:

- Small size of the needle active part
- Sensitivity
- Precision

Solution goes through the needle

SOLUTION

Sofraser, the inventor of the vibrating type at resonance frequency viscometer MIVI, has a dynamic R&D and application team always ready to meet the challenges of its customers by offering new solutions.

For this project, the small size of the needle, the viscometer active part, as well as its high sensitivity were used to offer an original and automated solution.

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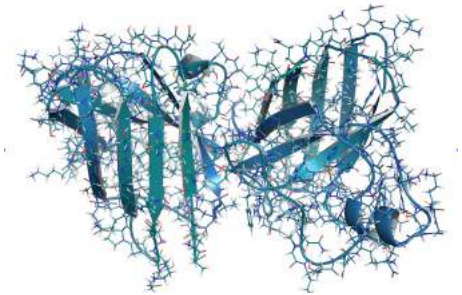
RESULT

The assay method became the reference for this leader in biotechnology.

Since beginning of the 1990s, the MIVI sensor has been integrated into multiple product developments allowing the filling of half a dozen patents in which Sofraser viscometer is used as a reference for the measurement of enzymatic power.



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thereof, it may be advantageous to carry out the method of the present invention at a pH below about 9, preferably at a pH below 6, more preferably at a pH of from about 4.5 to about 5.5, especially at a pH of about 5.0.

In the context of this invention, cellulase activity can be expressed in ECU. Cellulolytic enzymes hydrolyse CMC, thereby increasing the viscosity of the incubation mixture. The resulting reduction in viscosity may be determined by a vibration viscosimeter (e.g. MIVI 3000 from Sofraser, France).

Determination of the cellulolytic activity, measured in terms of ECU, may be determined according to the following analysis method (assay): The ECU assay quantifies the amount of catalytic activity present in the sample by measuring the ability of the sample to reduce the viscosity of a solution of carboxy-methylcellulose (CMC). The assay is carried out at 40° C.; pH 7.5; 0.1M phosphate buffer; time 30 min; using a relative enzyme standard for reducing the viscosity of the CMC(carboxymethylcellulose Hercules 7 LFD) substrate; enzyme concentration approx. 0.15 ECU/ml. The arch standard is defined to 8200 ECU/g.

Research Scientist
Enzyme Analytical Laboratory
Enzyme production, Novo Nordisk

“The assay method with the MIVI sensor is the most efficient available. The precision of the enzymatic activity matches perfectly with our need, the volume of the samples is minimal and operators appreciate how easy the needle is to clean.”

Decades
of utilization
trouble free