



Industrial Biotechnology

ISSN 1550-9087

VOLUME 7 NUMBER 2
APRIL 2011

The journal of biobased industries

**Replacing the “whole barrel”
of oil: Technology and perspectives**

PEER REVIEW

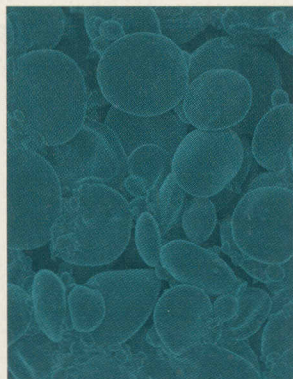
Lactic acid from triticale starch

Ethanol from wheat straw

Cassava wastewater for biohydrogen production

Mary Ann Liebert, Inc.  publishers

contents



Triticale starch granules

A new feedstock for lactic acid production. Starch granules from triticale (Ultima variety). Magnification 1000 X on FEG-SEM Hitachi S4700 at 2KV.

See XIAO et al, p. 129

PHOTO: F. PERRIN AND J. DENAULT

DEPARTMENTS

83 News...Science & business developments

94 Calendar...Industry events

Feature Commentary

97 POINT OF VIEW

How biorefining can replace the whole barrel of oil

Tim Eggeman and Dan Verser

99 ROUNDTABLE

Replacing the whole barrel of oil:
Industry perspectives

Alan Shaw, General Wesley Clark, Ross MacLachlan, and Paul Bryan

111 The value proposition for cellulosic and advanced
biofuels under the US federal renewable fuel standard

Biotechnology Industry Organization

118 Algae as a biofuel starter material:
A review of US patent documents

Sandra P. Thompson

122 Biotechnology pushes greening the chemical
industry: Biomass transformation the most relevant
driver of industrial biotechnology; clusters key in
Germany, Europe

Manfred Kircher

Industrial Biotechnology

VOLUME 7 NUMBER 2 • APRIL 2011

contents

Industry Report

- 127** Current state of the US ethanol industry
US Department of Energy Office of Biomass Programs

Peer Review

129 ORIGINAL RESEARCH

Direct fermentation of triticale starch to lactic acid
by *Rhizopus oryzae*

Zhizhuang Xiao, Meiqun Wu, Manon Beauchemin, Denis Groleau,
and Peter C.K. Lau

136 ORIGINAL RESEARCH

Production of ethanol from wheat straw
by pretreatment and fermentation at high
dry matter concentrations

Johan W. van Groenestijn and Ronald S. Slomp

143 METHODS

Long-term effect of nutrient supplementation
of cassava wastewater on biohydrogen production
by mixed culture

Valeria Reginatto, Franciele do Carmo Lamaison, Edna Regina Amante,
and Regina Vasconcellos Antônio