

Biorefinery Technologies and Products

Selected peer-reviewed extended articles
based on abstracts presented at the
International Conference for Young Scientists on
Biorefinery Technologies and Products
(BTechPro2022)

Aggregated Book

Edited by

**Dr. Kristine Meile, Dr. Ugis Cabulis
and Dr. Mikelis Kirpluks**



Copyright © 2022 Trans Tech Publications Ltd, Switzerland

All rights reserved. No part of the contents of this publication may be reproduced or transmitted in any form or by any means without the written permission of the publisher.

Trans Tech Publications Ltd
Seestrasse 24c
CH-8806 Baech
Switzerland
<https://www.scientific.net>

Volume 34 of
Scientific Books Collection
ISBN 978-3-0357-1873-7

Full text available online at <https://www.scientific.net>

Distributed worldwide by
Trans Tech Publications Ltd
Seestrasse 24c
CH-8806 Baech
Switzerland
Phone: +41 (44) 922 10 22
e-mail: sales@scientific.net

Printed with permission by
Curran Associates Inc. (2023)



Additional copies of this
publication are available from:

Web: www.proceedings.com/68422.html

Table of Contents

Preface

v

Chapter 1: Bio-Based Materials and Biorefining Technologies

Preliminary Study of Chemically Pretreated Densification of Juniper Wood for Use in Bone Implants

- L. Andze, M. Andzs, M. Skute, V. Nefjodov, M. Kapickis
and R. Tupcianuskas 3

A Study on Waste Paper Reinforced Recycled Polypropylene Biocomposite

- J. Jaunslavietis, J. Ozolins, M. Kalnins, G. Shulga, B. Neiberte, A. Verovkins
and T. Betkers 11

Rheological, Thermal and Mechanical Properties of Wood Plastic Composites

(WPCs) Based on Virgin and Recycled Polypropylenes and Birch Plywood Waste

- K. Kalnins, J. Kajaks and J. Matvejs 19

Hemp Shives Mycelium Composites - An Alternative Material for Traditionally Used Plastic Packaging

- G.D. Loris, I. Irbe, M. Skute, I. Filipova, L. Andze and A. Verovkins 29

Potential of some Latvian Industrial Crops Residuals for Conversion to Bio-Based Thermal Insulation Material

- A. Bērziņš, R. Tupcianuskas, M. Andzs and G. Pavlovichs 43

Characterization and Evaluation of Water-Based Ecological Paint for Protection of Wood Materials Coated Using Dipping Technique

- E. Sansonetti, D. Čīrule, E. Kuka, B. Andersons, I. Andersone and M. Danieks 51

The Research Landscape of Biorefinery: A Scientometrics Viewpoint

- A. Kokorevič 59

Suberic Acid Isolation from Birch Outer Bark and their Characterization

- D. Godina, R. Makars, A. Abolins, A. Paze, M. Kirpluks
and J. Rizhikovs 71

Potential of Crude Tall Oil Polyols for Rigid Polyurethane Foam Production and their Comparison with Tall Oil Fatty Acids Polyols

- E. Kauliņa, A. Abolins, A. Fridrihsone and M. Kirpluks 79

Study of Catalysts for Suberic Acid-Based Adhesive Polymerization

- R. Makars, J. Rizhikovs and A. Paze 87

Constraint Handling and Flow Control in Stirred Tank Bioreactors with Magnetically Coupled Impellers

- A. Buss, A. Suleiko, N. Jekabsons, J. Vanags and D. Loca 95

Cellulose Modification with Maleic Anhydride

- V. Fridrihsone, J. Zoldners, M. Skute, L. Andze and I. Filipova 103

Study of a Novel Biorefining Method for Obtaining 2-Furaldehyde, Acetic Acid and Pulp from Birch Wood

- M. Puke, D. Godina, P. Brazdauskas and J. Rizhikovs 111

Chapter 2: Materials and Technologies in Biopharmaceutics**The Study of Betulin Particles Containing Hydrogels Prepared by Antisolvent Precipitation**

A. Paze, S. Vitolina, R. Berzins, J. Rizhikovs, R. Makars, D. Godina and A. Teresko 121

Optimization of Betulin Colloidal Aqueous Suspension Pretreatment for Determination of Particle Characteristics

S. Vitolina, A. Paze, R. Berzins, J. Rizhikovs, R. Makars, D. Godina and A. Teresko 129

Adaptation of the Methylene Blue Adsorption Method for Specific Surface Area Determination of Betulin Particles

R. Berzins, A. Paze, S. Vitolina, J. Rizhikovs, R. Makars, D. Godina and A. Teresko 137

Vanillic and Meldrum's Acid Containing Antioxidant

L. Bērziņa and I. Mieriņa 145

Antioxidant Activity of Lignocellulose Pyrolysis by-Products after Levoglucosan Separation

K. Meile, E. Volkova, A. Jermolajeva and A. Zhurinsh 153

Chapter 3: Biotechnologies in Agricultural Production**Medium Formulation and Fed-Batch Cultivation of *Methylosinus trichosporium***

K. Dubencovs, A. Šuleiko, A. Šuleiko, S. Glukhikh and J. Vanags 163

Impact of Arginine Containing Fertilizer on Nitrogen Isotope Ratio and Elemental Content in Young Conifer Stands

M. Bērtiņš, L. Buša, D. Lazdina, K. Dumins, S. Zake, M. Klaviņš and A. Vīksna 169

Effect of Various Fertilizers on Stable Isotope Ratios and Relative Amino Acid Content in Apple Seeds

L. Buša, M. Bērtiņš, J. Ruško, A. Vīksna, I. Mišina, P. Górnáš and E. Rubauskis 177

The Effect of Bottom and Fly Wood Ash on the Rare Earth Element Content in Forest Soil and Blueberries (*Vaccinium myrtillus* L.)

V. Lazarenko, V. Rudovica, A. Vīksna, M. Bērtiņš, J. Burlakovs and D. Lazdina 185

Keyword Index 193**Author Index** 195