

RSC Sustainability

rsc.li/rscsus

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2753-8125 CODEN RSSUAN 1(4) 651–1056 (2023)



Cover
See Eric Husson, Catherine Sarazin *et al.*, pp. 853–865. Image reproduced by permission of Catherine Sarazin from *RSC Sustainability.*, 2023, 1, 853.



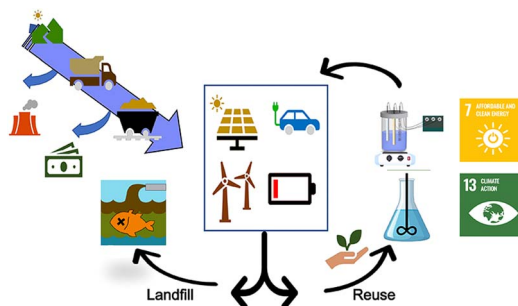
Inside cover
See Nuno Cerca, Alexander M. Kirillov *et al.*, pp. 866–875. Image reproduced by permission of Alexander M. Kirillov from *RSC Sustainability.*, 2023, 1, 866.

EDITORIAL

662

UN Sustainable Development Goals 7 and 13. How sustainable are the metals in our journey to clean energy storage?

Cristina Pozo-Gonzalo

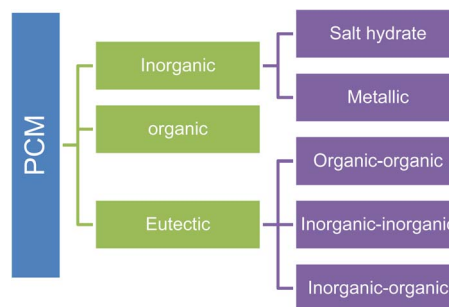


CRITICAL REVIEWS

665

Advancements in organic and inorganic shell materials for the preparation of microencapsulated phase change materials for thermal energy storage applications

Tushar Kanti Maiti, Prakhar Dixit, Amit Suhag, Sakchi Bhushan, Aparna Yadav, Namita Talapatra and Sujay Chattopadhyay*



Editorial Staff**Executive Editor**

Emma Eley

Deputy Editor

Jon Ferrier

Editorial Production Manager

Sarah Whitbread

Assistant Editors

Jamie Purcell, Aphra Murray, Alexander John, Emily Ellison, Jack Pitchers

Editorial Assistant

Alex Holiday

Publishing Assistant

Lee Colwill

Publisher

Neil Hammond

For queries about submitted papers, please contact Sarah Whitbread, Editorial Production Manager in the first instance. E-mail: rscsus@rsc.org

For pre-submission queries please contact

Emma Eley, Executive Editor.

E-mail: rscsus-rsc@rsc.org

RSC Sustainability (electronic: ISSN 2753-8125) is published 6 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

RSC Sustainability is a Gold Open Access journal and all articles are free to read. Please email orders@rsc.org to register your interest or contact Royal Society of Chemistry Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK
Tel +44 (0)1223 432398;
E-mail: orders@rsc.org

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017;

E-mail advertising@rsc.org

For marketing opportunities relating to this journal, contact marketing@rsc.org

RSC Sustainability

rsc.li/RSCSus

RSC Sustainability publishes experimental and theoretical work across the breadth of materials science.

Editorial Board**Editor-in-Chief**

Tom Welton, Imperial College London, UK

Associate Editors

Francesca Kerton, Memorial University of Newfoundland, Canada

Haichao Liu, Peking University, China

Vincent Nyamori, University of KwaZulu-Natal, Technology, China

South Africa

Cristina Pozo-Gonzalo, Deakin University,

Australia

Martin Prechtl, University of Lisbon, Portugal

Zhenyu Sun, Beijing University of Chemical

Editorial Board Members

David Cole-Hamilton, University of St

Andrews, UK

Mike Sutton, The Lubrizol Corporation, USA

Advisory Board

Jothi Kothandaraman, Pacific Northwest National Laboratory, USA

Chen Liao, Argonne National Laboratory, USA

Shengzhong Liu, Dalian National Laboratory for Clean Energy, China

Greta Patzke, University of Zurich, Switzerland

Peter Styring, The University of Sheffield, UK

Gyorgy Szekeley, King Abdullah University of Science and Technology, Saudia Arabia

Luigi Vaccaro, University of Perugia, Italy

Sónia Ventura, University of Aveiro, Portugal

Charlotte Williams, University of Oxford, UK

Iris Yu, National University of Singapore, Singapore

Information for Authors

Full details on how to submit material for publication in RSC Sustainability are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be made via the journal's homepage: rsc.li/RSCSus

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is © The Royal Society of Chemistry 2023. Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

Registered charity number: 207890

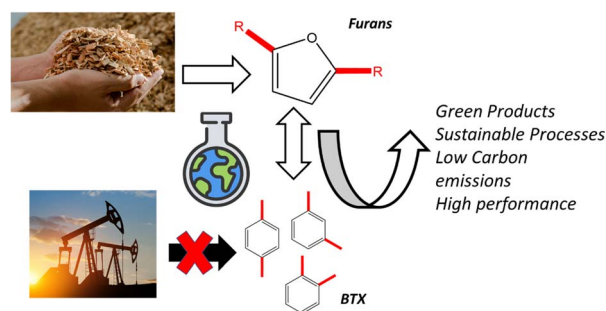


CRITICAL REVIEWS

698

Bioderived furanic compounds as replacements for BTX in chemical intermediate applications

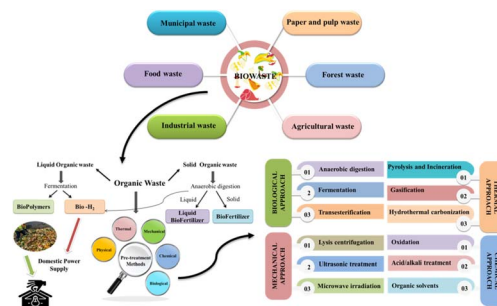
Amir Al Ghatta* and Jason P. Hallett*



746

Bio-based agricultural products: a sustainable alternative to agrochemicals for promoting a circular economy

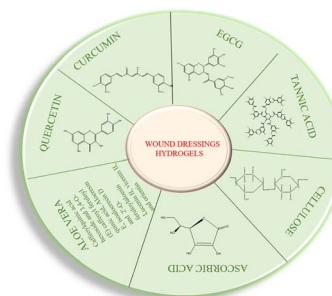
A. K. Priya, Avinash Alagumalai, Devarajan Balaji and Hua Song*



763

A review of past promises, present realities and a vibrant future for wound dressing from naturally occurring to sustainable materials

Supriya H., Sandeep Tripathi and Suryasarathi Bose*

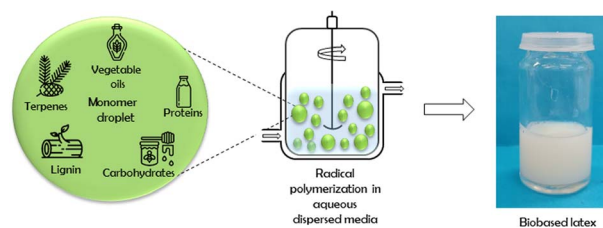


TUTORIAL REVIEW

788

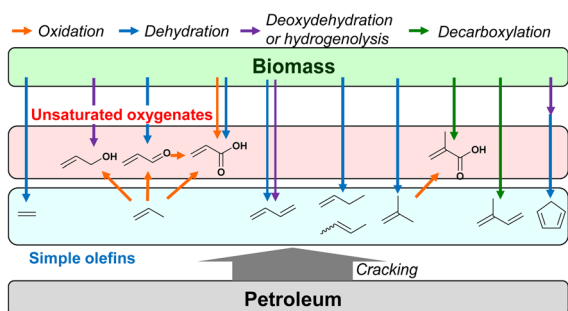
Recent advances in radical polymerization of bio-based monomers in aqueous dispersed media

Elena Rigo, Vincent Ladmiral, Sylvain Caillol and Patrick Lacroix-Desmazes*



PERSPECTIVES

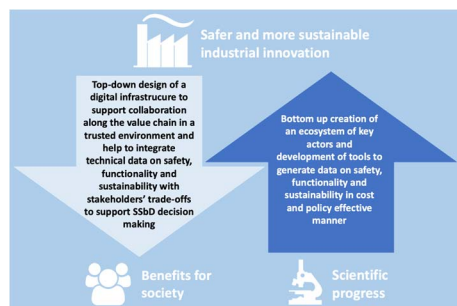
814



A perspective on catalytic production of olefinic compounds from biomass

Yoshinao Nakagawa,* Mizuho Yabushita and Keiichi Tomishige*

838

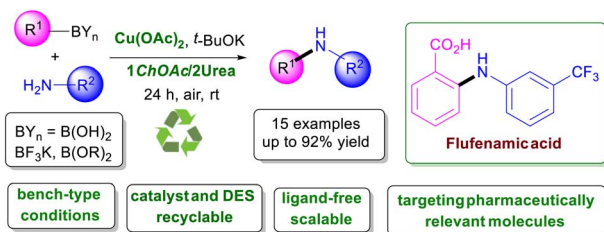


Safe-and-sustainable-by-design chemicals and advanced materials: a paradigm shift towards prevention-based risk governance is needed

Danail Hristozov,* Alex Zabeo, Lya G. Soeteman-Hernández, Lisa Pizzol and Stella Stoycheva

COMMUNICATION

847

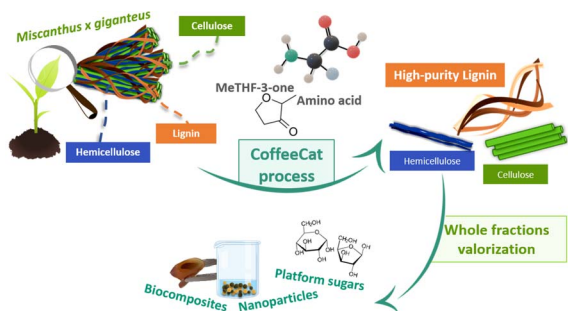


Cu-catalysed Chan–Evans–Lam reaction meets deep eutectic solvents: efficient and selective C–N bond formation under aerobic conditions at room temperature

Luciana Cicco, Paola Vitale, Filippo Maria Perna, Vito Capriati* and Joaquín García-Álvarez*

PAPERS

853



Revisiting organosolv strategies for sustainable extraction of valuable lignin: the CoffeeCat process

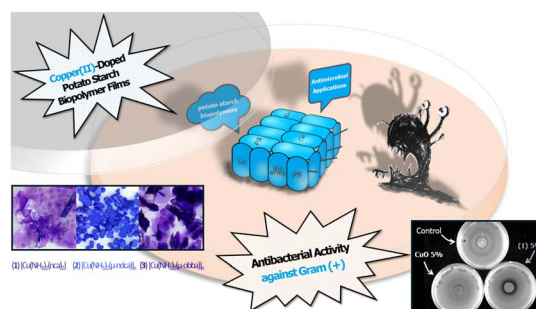
Marie E. Vuillemin, María Catalina Quesada-Salas, Caroline Hadad, Jordane Jasniewski, Eric Husson* and Catherine Sarazin*



866

Degradable copper(II)-doped starch-based biopolymeric films with antibacterial activity

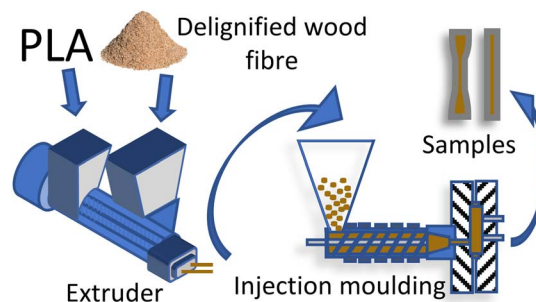
Kiryl I. Trusau, Paula Jorge, Ana Catarina Sousa, Tiago A. Fernandes, Vânia André, Marina V. Kirillova, Andrew I. Usevich, Nuno Cerca* and Alexander M. Kirillov*



876

The effect of size and delignification on the mechanical properties of polylactic acid (PLA) biocomposites reinforced with wood fibres via extrusion

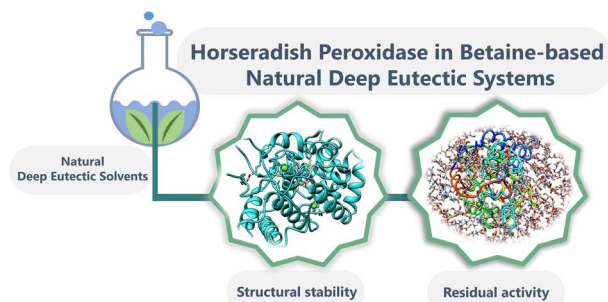
Renato Lemos Cosse, Vincent S. D. Voet, Rudy Folkersma and Katja Loos



886

Improving the activity of horseradish peroxidase in betaine-based natural deep eutectic systems

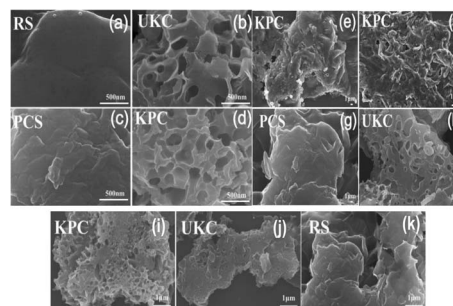
Liane Meneses, Nicolás F. Gajardo-Parra, Esteban Cea-Klapp, José Matías Garrido, Christoph Held, Ana Rita Duarte and Alexandre Paiva*



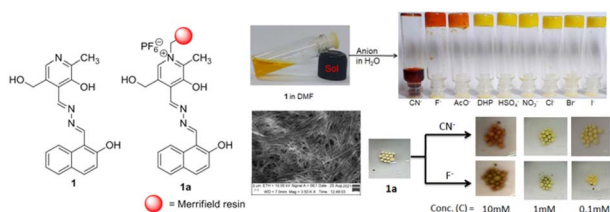
898

Adsorption of sulfate ions from water by CaCl₂-modified biochar derived from kelp

Bingbing Tian, Yalong Song, Ruben Wang, Yi Wang, Tianyang Wang, Jinhui Chu, Zhu Qiao, Min Li,* Jianjiang Lu* and Yanbin Tong



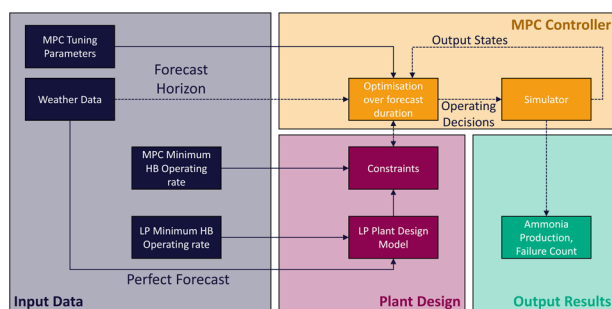
914



A new pyridoxal-derived gelator for selective recognition of CN⁻ and F⁻ under different conditions

Subhasis Ghosh, Nabajyoti Baildya and Kumares Ghosh*

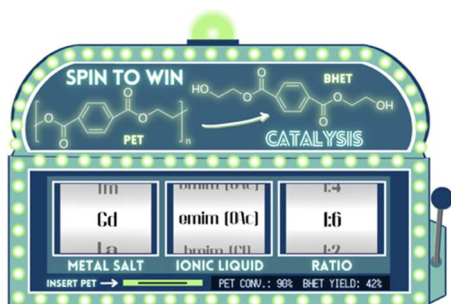
923



Impact of process flexibility and imperfect forecasting on the operation and design of Haber–Bosch green ammonia

Nicholas Salmon and René Bañares-Alcántara*

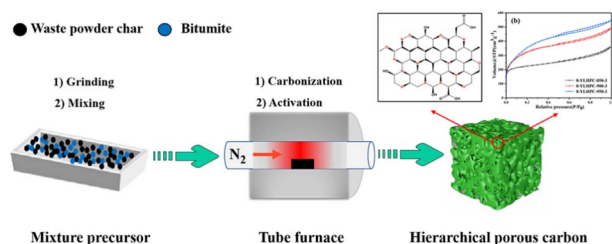
938



Understanding the important variables to optimize glycolysis of polyethylene terephthalate with lanthanide-containing ionic liquids

Nancy G. Bush, Caitlin H. Dinh, Casandrah L. Catterton and Megan E. Fieser*

948



Facile synthesis of functionalized porous carbon from bitumite mixed with waste powder char for excellent wastewater purification

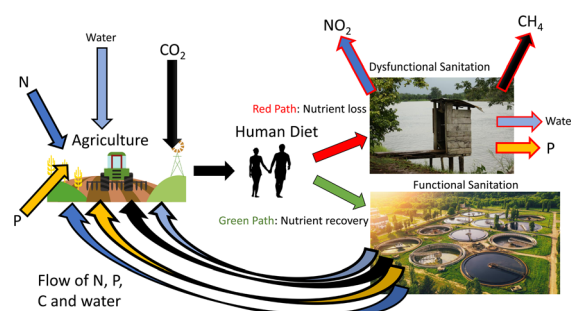
Yufeng Yin,* Yiting Zhao and Jing Wang



960

Will the circle be unbroken? The climate mitigation and sustainable development given by a circular economy of carbon, nitrogen, phosphorus and water

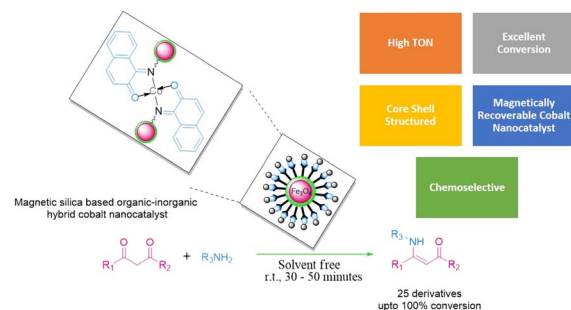
Patrick McKenna,* Fiona Zakaria, Jeremy Guest, Barbara Evans and Steven Banwart



975

A versatile core-shell hetero-nanostructure catalysed chemo-selective synthesis of β -enamino carbonyl compounds

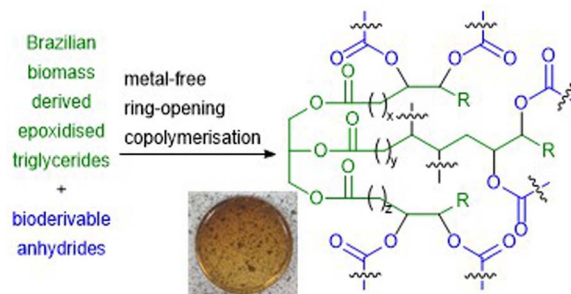
Sriparna Dutta, Prashant Kumar, Shivani Sharma, Sneha Yadav, Priyanka, Ranjana Dixit, Anju Srivastava and Rakesh Kumar Sharma*



987

Highly crosslinked polyesters prepared by ring-opening copolymerization of epoxidized baru nut and macaw palm oils with cyclic anhydrides

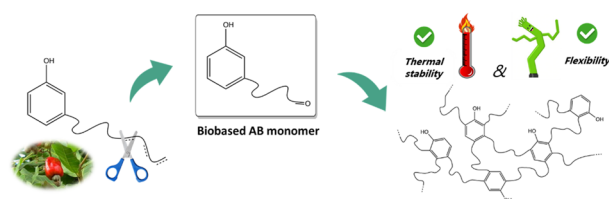
Aaron L. Vermiglio, Rafael T. Alarcon, Éder T. G. Cavalheiro, Gilbert Bannach, Thomas J. Farmer* and Michael North*



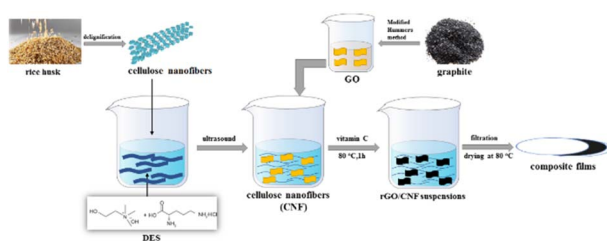
994

Eco-friendly synthesis of cardanol-based AB monomer for formaldehyde-free phenolic thermosets

Benoit Briou,* Lucas Jégo, Thomas De Dios Miguel, Nicolas Duguet* and Sylvain Caillol*



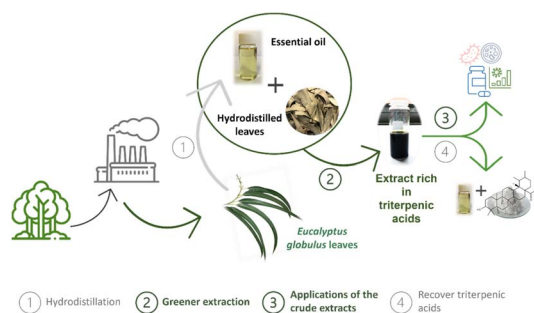
1006



Deep eutectic solvent assisted preparation of cellulose nanofibers and graphene composite films for supercapacitors

Zhongzheng Ma, Yi Duan, Yongqi Deng, Hongdong Qian, Xiuguo Yang, Hongyan Li, Luqian Ye, Bingxia Xu and Lifeng Yan*

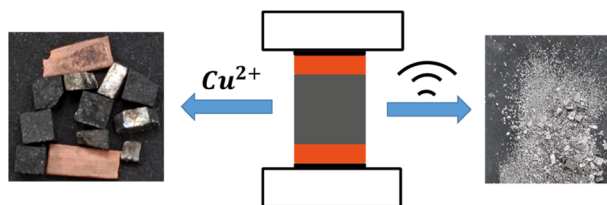
1016



An integrated green process for the extraction of triterpenic acids from *Eucalyptus globulus* leaves after hydrodistillation

Cátia S. D. Oliveira, Patrícia Moreira, Maria T. Cruz, Cláudia M. F. Pereira, Alexandre Gaspar, Carlos Pascoal Neto, Paula C. R. O. Pinto, Pedro Costa Branco, Artur M. S. Silva, Sónia A. O. Santos* and Armando J. D. Silvestre

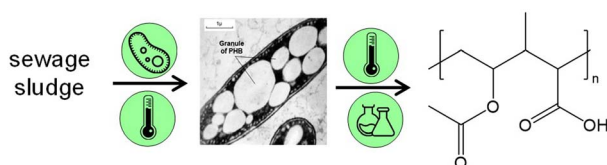
1025



Targeted recovery of metals from thermoelectric generators (TEGs) using chloride brines and ultrasound

Guillaume Zante,* Evangelia Daskalopoulou, Christopher E. Elgar, Rodolfo Marin Rivera, Jennifer M. Hartley, Kevin Simpson, Richard Tuley, Jeff Kettle and Andrew P. Abbott

1035



Poly(vinyl acetate-co-crotonic acid) from bio-based crotonic acid: synthesis, characterization and carbon footprint evaluation

Alexandra Jorea, Adriano Parodi, Tiziana Benelli, Luca Ciacci, Maurizio Fagnoni, Paola Galletti, Laura Mazzocchetti, Davide Ravelli, Cristian Torri, Ivano Vassura and Chiara Samori*



1043

Metabolic engineering for 4-aminophenylalanine production from lignocellulosic biomass by recombinant *Escherichia coli*

Hideo Kawaguchi, Shunsuke Masuo, Keiko Wakai, Naoki Takaya, Tomohisa Hasunuma, Tatsuo Kaneko, Satoshi Okada, Takashi Sazuka, Chiaki Ogino* and Akihiko Kondo

