

PNNL-33887

Production of 1,3-Butadiene from Renewable Oxygenated Feedstocks (Abstract)

CRADA 560 (PNNL 79181)

January 2023

Robert A. Dagle
Vanessa Dagle

Bridgestone Research, LLC

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor Battelle Memorial Institute, nor any of their employees, makes **any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.** Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or Battelle Memorial Institute. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

PACIFIC NORTHWEST NATIONAL LABORATORY
operated by
BATTELLE
for the
UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC05-76RL01830

Printed in the United States of America

Available to DOE and DOE contractors from the
Office of Scientific and Technical Information,
P.O. Box 62, Oak Ridge, TN 37831-0062;
ph: (865) 576-8401
fax: (865) 576-5728
email: reports@adonis.osti.gov

Available to the public from the National Technical Information Service
5301 Shawnee Rd., Alexandria, VA 22312
ph: (800) 553-NTIS (6847)
email: orders@ntis.gov <<https://www.ntis.gov/about>>
Online ordering: <http://www.ntis.gov>

Production of 1,3-Butadiene from Renewable Oxygenated Feedstocks (Abstract)

CRADA 560 (PNNL 79181)

January 2023

Robert A. Dagle
Vanessa Dagle

Prepared for
the U.S. Department of Energy
under Contract DE-AC05-76RL01830

Pacific Northwest National Laboratory
Richland, Washington 99354

Abstract

Reproduce and ascertain additional experimental catalyst performance data for 1-step conversion of oxygenated feedstocks to butadiene. Experimental data will also be obtained for a 2-step processing configuration where we will tailor the PNNL catalyst originally developed for 1-step processing by tailoring the Lewis acidity and metal properties, with a limited number of experiments. We will measure preliminary catalyst performance results for producing Butadiene from the two oxygenated feedstocks. Additionally, we will produce 30 g of butadiene that will be sent to the client for use in producing polybutadiene. Finally, experimental results will inform techno-economic analysis (TEA) modeling. TEA will focus on identifying the most economically favorable processing route to BD from either oxygenated feedstock. We will also project GHG emissions associated with each of the process models being considered for BD production, and compare such results to GHG emissions when produced from conventional methods (e.g., cracking of naphtha) using values from the literature.

Pacific Northwest National Laboratory

902 Battelle Boulevard
P.O. Box 999
Richland, WA 99354
1-888-375-PNNL (7665)

www.pnnl.gov