5th International Conference on
Green Chemistry and Technology
&
6th International Conference on
Environmental Chemistry and Engineering
July 24-26, 2017 Rome, Italy

Joseph F Stanzione III et al., Trends in Green chem, 3:2
DOI: 10.21767/2471-9889-C1-002

Vanillin: A renewable and versatile platform chemical for sustainable polymers

Joseph F Stanzione III[1], Elyse A Baroncini[1], Alexander W Bassett[1], Silvio Curia[1], Joseph R Mauck[1], Minxue Shi[1], Joshua M Sadler[2], John J La Scala[2] and **Giuseppe R Palmese[3]**

[1]Rowan University, USA
[2]Army Research Laboratory, USA
[3]Drexel University, USA

Polymers derived from renewable resources are becoming considerably attractive as sustainable alternatives to their petroleum-derived counterparts. A renewable resource that has gained considerable attention within the past few decades as a viable feedstock is lignin. Lignin is an aromatic biopolymer found in all woody biomass that could yield highly valuable aromatic platform chemicals, including vanillin, when strategically depolymerized. Vanillin, 4-hydroxy-3-methoxybenzaldehyde, is a unique phenolic aldehyde that has been cultivated for flavoring and fragrance for many centuries. However and more recently, with the growing demand to increase our cyclical economy and, thus, improving the planet's overall well-being, vanillin is being utilized as a versatile platform chemical and monomer in the synthesis of a wide range of polymers. This presentation focuses on the history of vanillin in the development of sustainable polymers, including our research efforts in the development and characterization of vanillin-based thermoplastics and thermosets, including epoxies, vinyl esters, polyesters, and polycarbonates.

Figure 1: Schematic illustrating the versatility of vanillin in the development of a wide variety of sustainable polymers.

Biography

Joseph F Stanzione III received his MS in Chemical Engineering at Drexel University and his PhD at the University of Delaware under the direction of Professor Giuseppe Palmese and Professor Richard Wool, respectively. He then joined the Chemical Engineering Faculty of Rowan University in 2013. His research program focuses on the utilization of lignocellulosics as an alternative renewable chemicals feedstock; green chemistry and engineering for the development of next-generation lignocellulosic biorefineries; and bio-based polymers and composites for high-performance, biomedical, and energy applications. His work has resulted in one patent, four patent applications, and publications in journals such as *Green Chemistry, ChemSusChem, Journal of Applied Polymer Science and ACS Sustainable Chemistry & Engineering*. Additionally, he is a Co-recipient of US EPA's Presidential Green Chemistry Challenge Award in 2013 and Co-editor of the Special Issue: *Sustainable Polymers and Polymer Science*: Dedicated to the Life and Work of Richard P Wool published by the *Journal of Applied Polymer Science* in 2016.

stanzione@rowan.edu

Notes: