

# 9<sup>th</sup> European Chemistry Congress

June 17-18, 2019 | Berlin, Germany

## Fully bio-based epoxy thermosets with low-dissipation factor

Chien Han Chen<sup>1,2</sup> Ru Jong Jeng<sup>1</sup>, Shih Huang Tung<sup>1</sup> and Ching Hsuan Lin<sup>2</sup>

<sup>1</sup>National Taiwan University, Taiwan

<sup>2</sup>National Chung Hsing University, Taiwan

Epoxy resins are the most popular materials in the polymer history. However, most epoxy resins were produced from the petrochemical materials. To achieve sustainability, we provide a new strategy to prepare fully-bioased epoxy resins from the esterification of bio-based diacids with eugenol, followed by oxidation of the allyl bonds. Furthermore, the epoxy resins are designed to exhibit both the the active ester and epoxy groups, so they can be thermally cured through the exchange reaction of active ester and epoxy groups. Therefore, no additional curing agents are required to cure the epoxy resins. Through NMR, DSC, reology and FTIR analysis, we confirm that they exhibit self-curing characteristics. The self-cured epoxy thermosets do not contain highly polar secondary alcohol, which is always formed when epoxy resins are cured by multiamine or multiphenol. Therefore, the resulting thermosets exhibit very low dissipation factors (around 0.007 U), which is competitive to any other epoxy thermosets. In short, a strategy for preparing fully bio-based epoxy resins and fully bio-based epoxy thermosets with very low dissipation factors are revealed in this work.

## Biography

Chien Han Chen has completed his Master Degree in 2016 from Department of Chemical Engineering, National Chung Hsing University, Taiwan and continue his PhD in the Insitute of Polymer Science and Engineering, National Taiwan University, Taiwan. He majors in Polymer Chemistry and Green Chemistry. He has published 14 SCI papers since 2016, mainly focusing on the development of high-Tg, flame-retardant and low-dielectric constant polymeric materials.

jain6792002@gmail.com

## Notes: