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Progress on soybean oil based thermosetting resins

*Jin Zhu**, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Science, Zhejiang, China
Songqi Ma, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Science, Beijing, China
Xiaoqing Liu, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Science, Beijing, China

A series of thermosetting resins based on soybean oil were designed and synthesized at Ningbo Institute of Materials Technology and Engineering (NIMTE), Chinese Academy of Sciences. This talk will review progress on these resins in recent years. Due to the long flexible aliphatic chain in soybean oil, soybean oil-based thermosets often exhibit poor thermal and mechanical properties. To address this issue, lots of modifiers derived from renewable resources including rosin, itaconic acid, gallic acid, eugenol, etc. were synthesized to be used together with acrylated epoxidized soybean oil (AESO), and thermosetting materials with improved performance were obtained, and the structure-property relationships of the materials were investigated. Meanwhile, itaconic acid was also utilized as a green alternative to acrylic acid to react with epoxidized soybean oil and produce a substitute for AESO. Thus, these works not only enhanced the properties of the soybean oil-based thermosetting materials but also made the materials “greener”.