



Name: Zhou Fang

Name of the project: Synthesis of new galactaric acid derived monomers containing functional groups that allow the synthesis of biobased resins for self-healing coatings and toner applications

Abstract of the project: Diethyl galactarate is a molecule obtained from sugar beet pulp, a waste product from sugar production. Typically, in comparison with common monomers, sugar-derived monomers contain functionalities in their backbone like hydroxyl groups. Those molecules may be polymerized directly utilizing sophisticated methods or hydroxyl functionalities can be protected or further functionalized by acetal formation prior to the polymerization process. In previous work, efforts have been made seeking opportunities brought by different acetal protections in diethyl galactarate monomers and polyamides were prepared thereof. It was shown that the different acetal protections significantly change the thermal properties and the hydrophilicity of the polymers derived thereof.

In this work, cyclic galactaric acid derived monomers with reactive functional groups that allow reversible crosslinking will be prepared and they will be converted into coating applications with the self-healing property thanks to the presence of dynamic bonds. In addition, polyester and polyether derived from functional monomers will be applied as toner resins and their properties will be studied as well.

Introduction of the ESR: My name is Zhou and I come from China, where I completed my bachelor study in chemical engineering. Then I continued my study in chemical engineering with a focus on polymer materials at University of Groningen. My master thesis is about the synthesis and characterization of water-based polyurethane coatings with anti-discoloration properties for wooden substrates.

Keywords: Sugar beet pulp, galactaric acid derived monomers, self-healing coatings, toner resins

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