Polystyrene branched Polyesters and their Characterization

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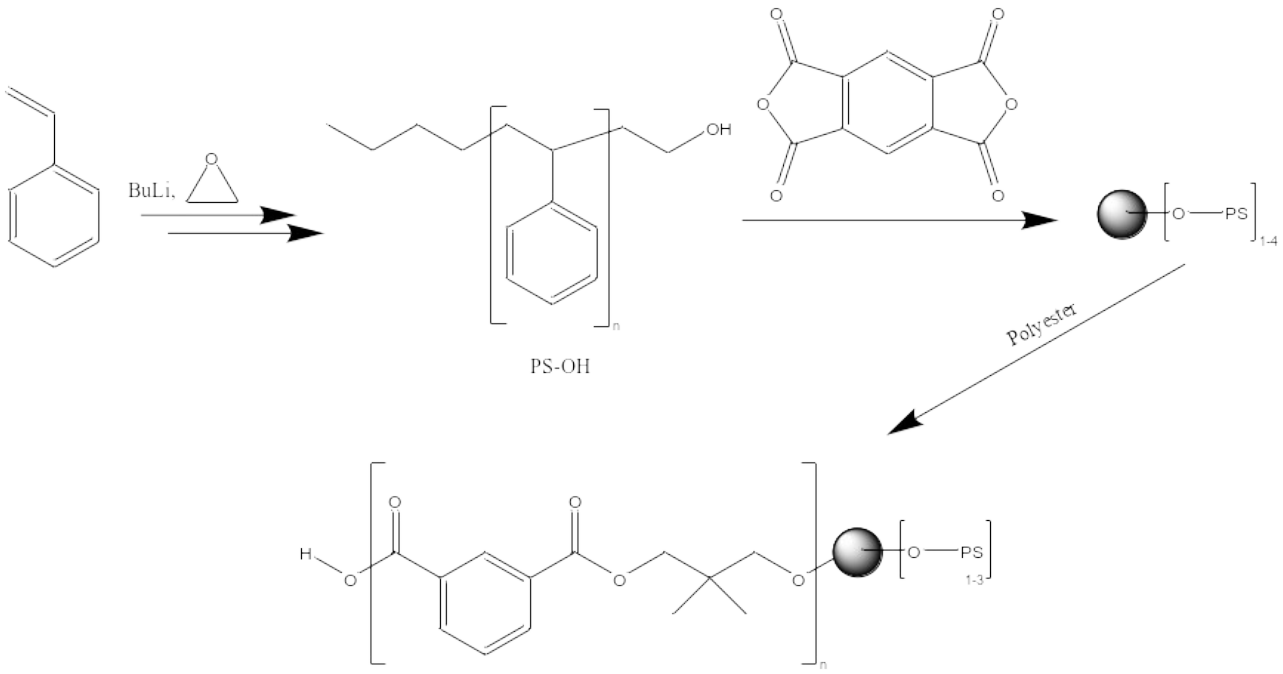
In order to improve properties of polyester resins (PES) related to polarity, stickiness on non polar substrates, hydrophobicity, etc., we have tried to incorporate polystyrene blocks into such resins. In a first step polystyrene (PS) with terminal hydroxyethyl groups was prepared by ionic polymerization, which was then attached to multifunctional carboxylic acids. At this point multi arm star polymers could be retrieved that were valuable intermediate products for the improvement of polymer characterization techniques based on size exclusion chromatography.
The now functionalized polystyrene chains were then incorporated into precondensed polyesters bearing dedicated functional groups [1] and branched PS-PES systems obtained. This paper reports the first results on synthesis of such polymers and the use of SEC-MALS and MALDI-MS techniques to monitor reaction progress and final structures of these materials [2].



Scheme 1. Synthesis route to polystyrene branched polyesters.

Keywords: polymer synthesis, polyester, MALDI, SEC

References

[1] Saller, K.M..; Hubner, G.; Schwarzinger, C. Introducing free carboxylic acid groups along polyester chains using dimethylolpropionic acid as diol component. *European Polymer Journal* **2023**, *198*, 112442.
[2] Saller, K.M..; Gnatiuk, I.; Holzinger, D.; Schwarzinger, C. Semiquantitative Approach for Polyester Characterization Using Matrix-Assisted Laser Desorption Ionization/Time-of-Flight Mass Spectrometry Approved by 1H NMR. *Analytical Chemistry* **2020**, *92*, 15221-15228.