

## Improved Performance Lignin-Based Plastics

### Disclosure Number

201403426

### Technology Summary

Here we disclose a simple method to produce thermoset elastomer, toughened plastics, and thermoplastics elastomer based on lignin blends. Our earlier pending application (ID-3165: U.S. Patent Application No. 14/311,893, filed by UT-Battelle, LLC, dated June 23, 2014) required multiple additives. This work led us to develop binary mixture of lignin and matrix that exhibits superior mechanical properties without use of any additive. In a formulation, the material behaves as an elastomer with 14 MPa of tensile strength and 230 % of elongation at break. In another formulation, the material behave like a toughen plastic with 32 MPa and 160 % of elongation at break. Finally, we also show a material with thermoplastic elastomer behavior that exhibit mechanical properties in between of two formulations.

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