Effect of Lignin on the Thermo-Mechanical Properties of Transgenic Aspen

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Lignin genetic engineering changes

↓

lignin content and structure

↓

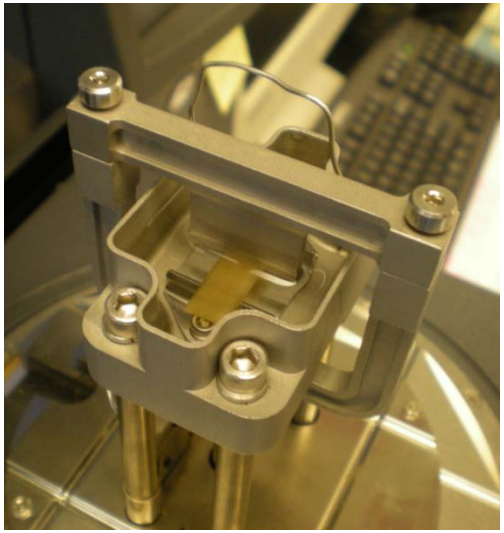
Improved pulping efficiency, better digestibility, lower chemical and energy consumption, reduced environmental impacts

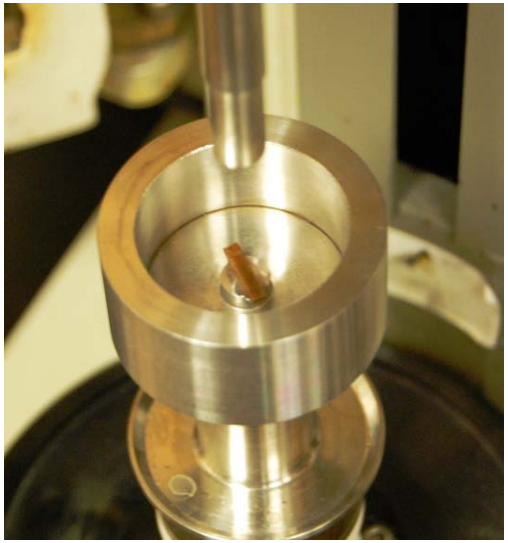
↓

Change in thermo-mechanical properties?

Materials:

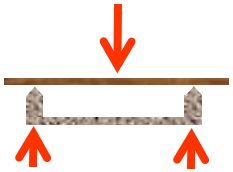
- **Wild-type**
- **Reduced lignin content genetic group**
- **Increased S/G ratio genetic group**
- **Reduced lignin content and increased S/G ratio genetic group**



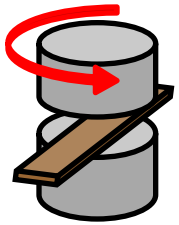


Methods:

Submersion three-point bending in DMA Q800.



Parallel plate compression-torsion in DMA AR-2000.



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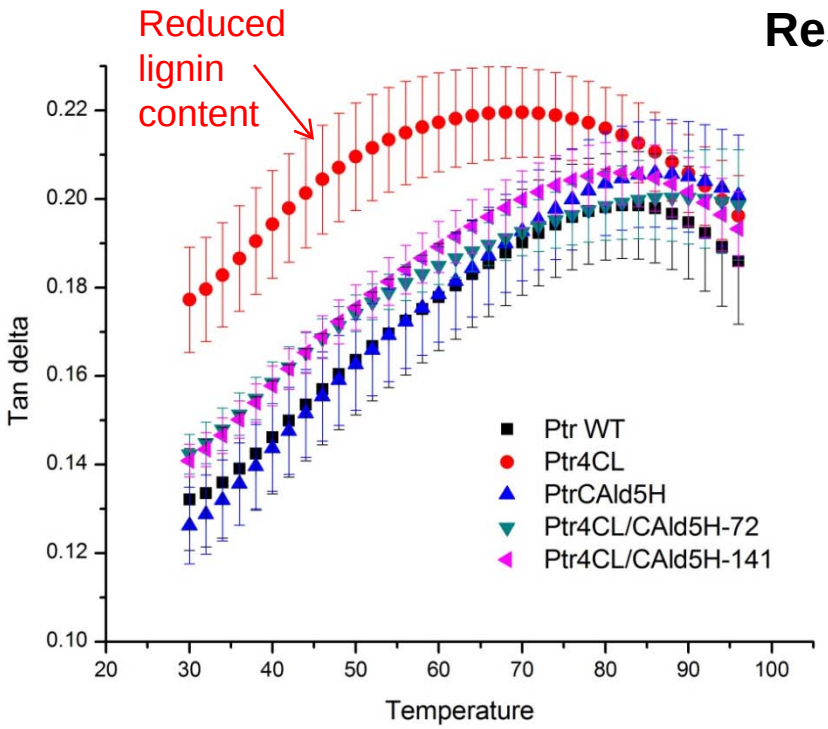
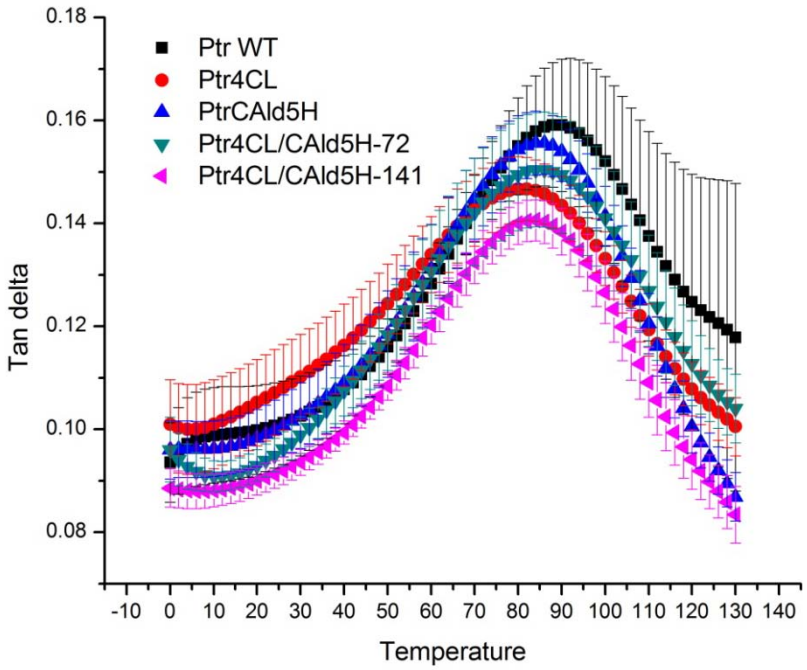
Results



Submersion three-point bending in DMA Q800.



Parallel plate compression-torsion in DMA AR-2000.

Conclusions

Reduction in lignin content ↓ **Decrease** in glass transition temperature

Increase in S/G ratio (change in structure) ↓ **No change** in glass transition temperature