

# Lignin Applications

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Agrotechnology & Food Innovations

Lignin is, next to cellulose, the most abundant renewable resource. Worldwide about 50 million tons of lignin is being produced annually as residue in paper production processes. Most lignin waste is burned to generate energy for the pulp mills. However, based on its interesting functionalities and properties, lignin offers perspective for higher added value applications in renewable products. Besides sulphite and kraft lignins, sulfur-free lignins obtained from alkaline pulping of non-wood fibres and a novel precipitation process will become commercially available. These lignin types not only lack sulfur groups, but possess interesting properties for different applications.

## Research activities

Fundamental and applied research has been performed for a large variety of lignins from wood and non-wood fibres. This includes chemical and physical characterisation and determination of lignin properties by established protocols (functional groups, molecular weight, solubility, rheology, etc.) and development of different applications as described below. Chemical modification is being performed to adjust the functional properties for a specific application.

## Facilities

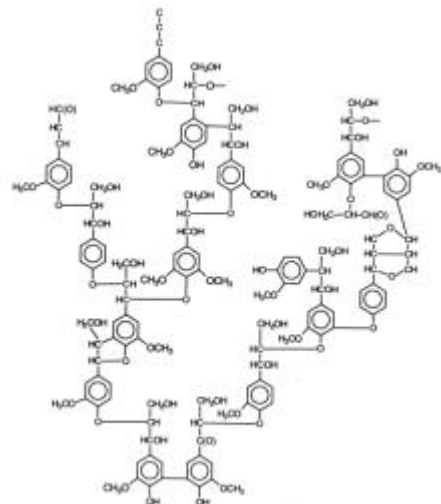
- Lignin characterisation with standardised protocols for wet chemical analysis, thermal (DSC, DMTA, TGA) and spectroscopic methods (FTIR, NMR)
- Evaluation of functional properties for potential applications
- Chemical modification
- Application development
- Stability and biodegradability tests

## Applications

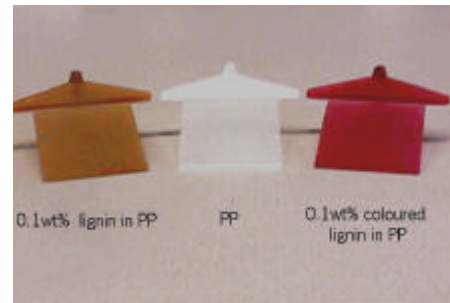
- Wood adhesive
- (Simultaneous) UV stabiliser and colouring agent
- (Bio)polymer additive
- Surfactant
- Radical technology
- Durability enhancement

## Related projects

- Eurolignin: Coordination network for lignin



*Structural lignin model (Adler 1977)*



*Raw and coloured lignin in a synthetic polymer*



*Tensile testing for plywood application*