International Conference on **Resource Chemistry** March 08-09, 2021



WOOD AS RESOURCE FOR WOOD COATINGS AND ADHESIVES

Frauke Bunzel¹, Claudia Schirp¹ and Steven Eschig¹

¹ Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut WKI, Bienroder Weg 54E, 38108 Braunschweig, Germany, Tel: +49 531 2155-422

Introduction

- Wood is the most important domestic, renewable raw material in Germany
- Neither directly nor indirectly in competition with food or feedstuffs
- Wide range of possibilities for the production of intermediate and end products
- Utilization that conserves resources as much as possible (utilization cascade)

Not only wood-based materials can be produced from wood, since wood consists of different components that can be used as raw materials for binders:



- Improvement of water vapor diffusion (more open) while maintaining spray water repellent properties
- Regulation of the processing viscosity
- Improvement of hail impact resistance



© Fraunhofer WKI | Manuela Lingnau

 Synergies for the intumescent effect in fire protection coatings



Sugar from Hemicellulose for Coatings and adhesives

(Sugar-Coating-Project (2008-2011) FKZ: 22002108 and InnFla-Project (Start April 2021);Sugar-Adhesive-Project (2016-2019) FKZ: 22027514)

Coatings:

- Dispersion adhesives for wood-based materials
- Significant reduction of formaldehyde emissions from wood-based materials
- Advantages in molded wood production compared to



Adhesive (LignoGlue (2016-2019) FKZ:22004415)

Two component Polyurethane for D2 wood bonding





Binder

බ Fraunhofer WK

- EPI-Adhesives for wood bonding:
 - Emulsion Polymerization Isocyanates (EPI)
 - Use of lignin polyethers
 - Fast curing
 - Pass D4 (long lasting exposure to water)



unmodified PVAc dispersion adhesives

Adhesives:

- Emulsion polymerization of copolymers of acrylates and sugar monomers
- Binders with up to 45 % sugar monomer could be realized
- Base formulations for wood coatings (interior) successful



Printing inks (LignoPrint (2017-2020) FKZ:22036714)

- Replacement of rosin in offset printing inks (high melting point and non-polar)
- Lignin alkyds with high melting point up to 99°C and low polar content
- Could be used as printing inks



🖸 Fraunhofer WKI, Manuela Lingnau

