

LIGNIN POLYOLS FOR PU COATINGS

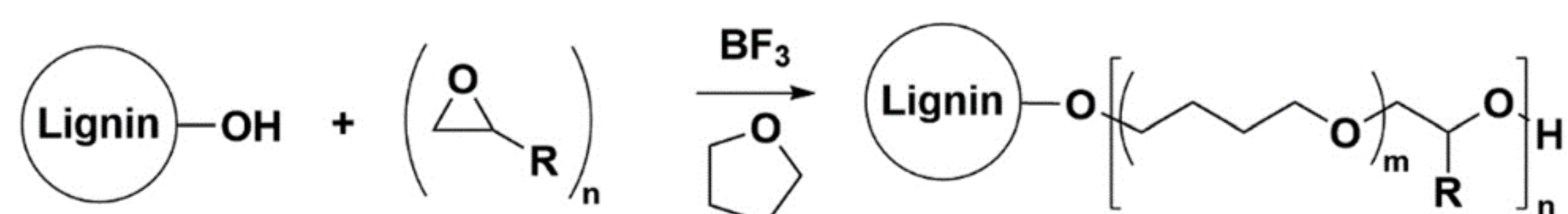
Pablo Ortiz¹, Walter Pitacco², Nour Mattar³

¹ TECNALIA, Leonardo da Vinci 11, Parque Tecnológico de Alava, E-01510 Vitoria-Gasteiz, Spain
² AEP POLYMERS, AREA Science Park, SS 14, km 163,5 - 34149 Basovizza, Trieste, Italy
³ ECOAT, Av. Louison Bobet 1, 06130 Grasse, France

LIGNICOAT project overview



Lignin polyol synthesis



- Novel cationic ring-opening polymerization process developed by TECNALIA. Reaction at room temperature and without pressures.
- Need of fractionation to reduce the Mw of starting Kraft lignin.
- Scaled-up by AEP to 5L reactor
- Two lignin polyols produced:
 - 1) 2800 Mw, 110 OH # for PUD
 - 2) 2000 Mw, 350 OH# for NIPU



PU coatings

PU Dispersions

Properties	LPO-PUD	Reference
Lignin polyol (%)	18	0
Color (Gardner)	19	0
Viscosity (cP)	2723	700
Gloss – 60° (GU)*	132	110

*100µm wet film thickness

Coatings

- Similarity performance in terms of tack-free time, adhesion on metal (Class 0), flexibility, and impact resistance.

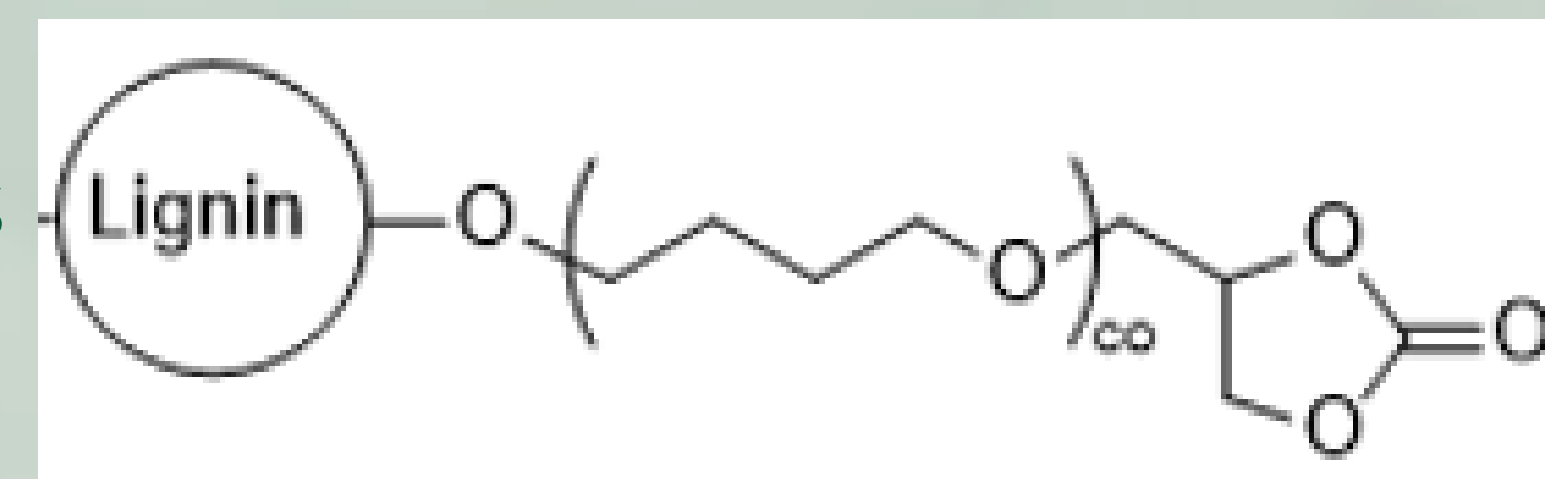


- Lower chemical resistance and hardness of the formulation with lignin polyols.

NIPU coatings

Cyclic carbonates

- Reaction of diol-terminated lignin polyols with dimethylcarbonate (DMC)



- Catalyzed by TBD or DBU, 1-2h, 80°C

Coatings

- Curing agent HMDA
- Curing at 90°C for 16h
- Blank reaction (DMC+HMDA) does not cure
- Up to 90° Persoz hardness

