

# LIQUEFACTION OF KRAFT LIGNIN USING DIFFERENT SOLVENTS

Silvia Helena Fuentes da Silva, University of Basque Country-Spain  
Patricia Soares Bilhalva dos Santos, Federal University of Pelotas-Brazil  
Darci Alberto Gatto, Federal University of Pelotas-Brazil  
Jalel Labidi, University of Basque Country-Spain

# INTRODUCTION

- Lignin is an abundant natural aromatic biopolymer with different functional groups in its structure. Among them, phenolic compounds that make of lignin a strong candidate to replace petrochemical-based polyols.
- However due to the complex structure, lignin has a low reactivity.

# GOAL

- In this study, Kraft lignin was converted into a more reactive black liquor using liquefaction under reflux.
- The influence of different solvents and ratios in a yield, hydroxyl number, viscosity and pH of liquefied lignins were analyzed.

# MATERIALS AND METHODS

Polyethylene glycol#400 (PEG)

Glycerol (G)

Ethylene glycol (EG)

(PEG:G) and (EG:G)

80:20 and 90:10



- Without catalyst

- 15 wt% of Kraft lignin

- 1 hour

Figure 1 – Reaction conditions of liquefaction under reflux

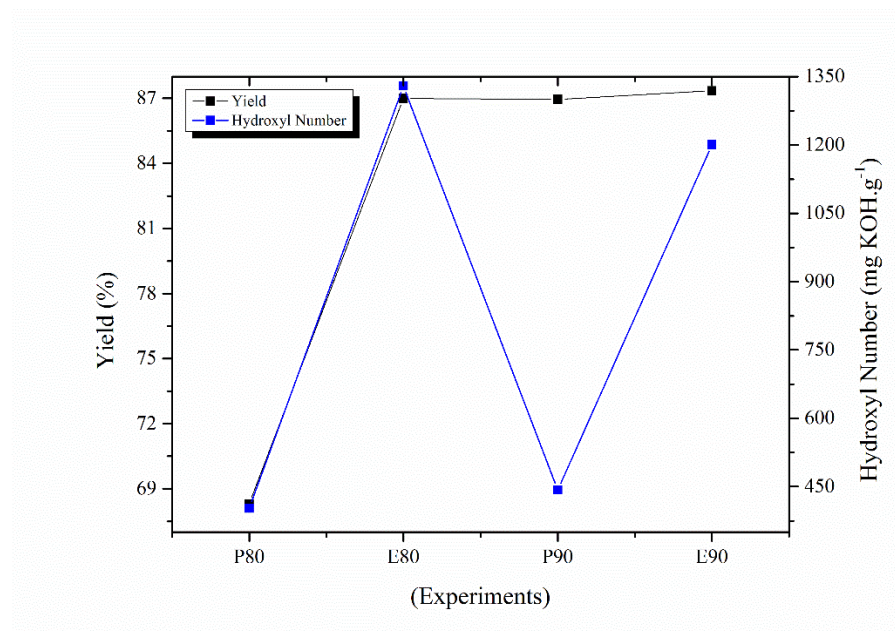


Figure 1 – Liquefied lignins with different solvents and ratios (P80: PEG:G=80:20; E80: EG:G=80:20; P90: PEG:G=90:10; E90: EG:G=90:10). Reaction conditions are 15 wt% of lignin in relation solvents, without catalyst at 160°C for 1h.

<b>SAMPLE</b>	<b>VISCOSITY (mPa.s)</b>	<b>pH</b>
<b>P80</b>	162.0	5.6
<b>E80</b>	26.4	5.01
<b>P90</b>	66.1	5.62
<b>E90</b>	19.7	4.92

Figure 1 – Effect of different solvents and ratio in the viscosity and pH of liquefied lignins.

# CONCLUSIONS

- Liquefied lignins with PEG:G as solvents have the lowest values of yield and hydroxyl number and higher viscosity than those with EG:G.
- The solvent:solvent ratio has more influence on the yield and viscosity.
- The type of solvent or the ratio had no influence on the pH of the liquefied lignins.



Thanks for your attention!

