

Analysis of chemical structures of EOL

- Contents of phenolic OH and Molecular weight-

Lignin, one of major components in lignocellulosic biomass, is aromatic biopolymer. It was connected by various bonds including ether bonds and C-C bonds.

Because lignin precursor has phenolic hydroxyl group, contents of phenolic hydroxyl group in lignin contribute to different structural characteristics of lignin.

1. Materials

- ① Lignin sample : Ethanol organosolv lignin (6th week)
- ② Chemical reagent and solvent: Pyridine, Acetic anhydride, Dioxane, Pyrroliding, 1-methyl naphthalene

2. Methods

Acetylation

- ① Put a sample (50 mg of lignin powder) into glass vial with 0.5 ml of pyridine and acetic anhydride.
- ② After mixing the mixture, and react for 3 hrs at 105°C
- ③ Dropping the reaction mixture in deionized water
- ④ After centrifuge (12,000rpm, 4°C, 15min), Supernatants are discarded, and precipitates are lyophilized.

Molecular weight

- ① Put a sample (2 mg of acetylated lignin powder) into glass vial with 1ml of tetrahydrofuran
- ② After filtering, the mixture is analyzed by gel permeation chromatography

Content of phenolic hydroxyl group-Aminolysis reaction

- ① 20 mg of EOL is put in a glass vial, and then 0.5 ml of dioxane and pyrrolidine are added.
- ② Internal standard, 10 μ l of 1-methylnaphthalene was added in mixture
- ③ The mixture is reacted in room temperature for 1hr and shaken every 10 min.
- ④ After reaction, the mixture is filtered by hydrophobic filter
- ④ Then, final products is analyzed by using GC/MS.

◆ Report

- ※ Compare the results depending on the each condition by sharing data together
- ※ Report should be written by MS words (10 points, line spacing 1) or Hancom office (10 points, line spacing 120).
- ※ Procedure of report (in Korean): 1. Introduction, 2. Materials and methods, 3. Results and discussion, 4. Conclusions, 5. References
- ※ Assignment should be appended to report. (If you copy and paste, you cannot get a grade)