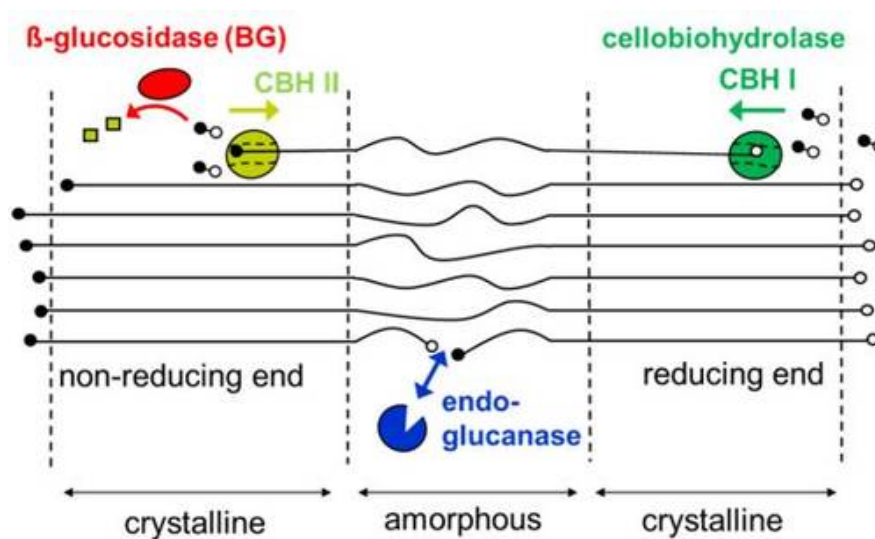
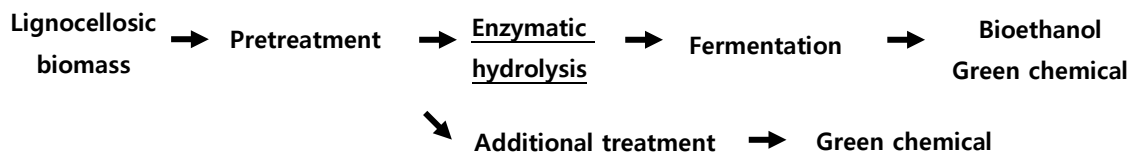


## Bioenergy Production (III) – Enzymatic hydrolysis (Saccharification)

Fermentable sugar (glucose) from lignocellulosic biomass can be obtained by enzymatic hydrolysis process. During the enzymatic hydrolysis, several enzymes, such as endocellulases (endoglucanases), exocellulases (cellobiohydrolases), and  $\beta$ -glucosidase, work on the cellulose chain in cell wall structure. In this lab, we will conduct enzymatic hydrolysis using solid residue with commercial enzyme cocktail, and then evaluate how many glucose was produced.



### 1. Materials

- ① Sample : solid residue (obtained in 3<sup>rd</sup> week) **Mongolian Oak** (1 group), **Larch** (2 group), **Rapeseed stalk** (3 group)
- ② Equipment : Shaking incubator, Oven (105°C), Desiccator, Aspirator
- ③ Enzyme : Cellulase cocktail (Cellic Ctec2, Novozymes)

### 2. Methods

- ① Put the solid residue (1 g of the oven-dried weight) into 250 mL of Erlenmeyer flask.

- ② Mix 50 mM of sodium acetate buffer (pH 5.0) with solid residue as total water content is 100 mL. The dose of sodium acetate is calculated according to the moisture content of solid residue.
- ③ Make a solution including cellulase cocktail and sodium acetate buffer, and then put 1 mL of the solution into the flask.
- ④ Take 72 hours incubation by shaking incubator at 50°C, 150rpm.
- ⑤ After 72 hours, analyze the amount product (glucose) of enzymatic hydrolysis by HPLC, and also compare with species.

### **3. Notice**

- ※ **Report should be written by MS words (10 points, line spacing 1) or hancm office (10 points, line spacing 120).**
- ※ **Write your report according to that order (in Korean or English): 1. Introduction, 2. Materials and methods, 3. Results and discussion, 4. Conclusions, 5. References**
- ※ **Describe result of 3<sup>rd</sup> week data, 4<sup>th</sup> week data, and 5<sup>th</sup> week data together, and should include result of other groups.**
- ※ **Assignment should be appended in report. (If you copy someone's report, you cannot get a grade.)**
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