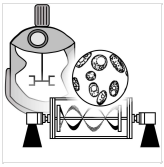

Apr 29, 2021

Determination of lignin in lignocellulosic biomass

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1 Works for me dx.doi.org/10.17504/protocols.io.bumtnu6n

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ABSTRACT

Explanation of NREL/TP-510-42618[1] laboratory analytical procedure.

[1]A. Sluiter, B. Hames, R.O. Ruiz, C. Scarlata, J. Sluiter, D. Templeton, D. Croker, Determination of Structural Carbohydrates and Lignin in Biomass, Biomass Analysis Technology Team Laboratory Analytical Procedure, National Renewable Energy Laboratory Golden, CO, 2010 NREL/TP-510-42618.

DOI

dx.doi.org/10.17504/protocols.io.bumtnu6n

PROTOCOL CITATION

Magdiel Lainez 2021. Determination of lignin in lignocellulosic biomass. **protocols.io** https://dx.doi.org/10.17504/protocols.io.bumtnu6n

CREATED

Apr 29, 2021

LAST MODIFIED

Apr 29, 2021

PROTOCOL INTEGER ID

49555

Preparation of biological material

1 First, mill the material until reaching a particle size between **0.250 mm** and **0.425 mm** for better results.

If previously it's necessary to wash the material use distiller water. Do this with the objective to remove starch, gums, and non-structural carbohydrates. Then dry the biomass.

2 Take ready a glass Gooch crucible. Dry until constant weight a glass Gooch crucible of pore fine [type F].

Glass Gooch crucible

Characterization of lignin 2h 30m

3 5m

Weight **300 mg** of dry biomass into an assay tube. Be accurate!

4 1h

Add **3 mL** of 72% H_2SO_4 to the assay tube and put into a water bath at **30 °C** during **01:00:00**
Use a glass rod or magnetic stirrer to homogenize the mix.

5 5m

Transfer the mix to a glass bottle. Add **84 mL** of distiller water to dilute at 4% H_2SO_4.

Take care to add only **84 mL** . You can do this using an analytical balance. The total weight of biomass and 4% H_2SO_4 will be **89.19 g** . See the calculations in the file attached **Water to Add.xlsx**

6 1h

Autoclave the material at **121 °C** during **01:00:00**

7 20m

Filter the material autoclaved using the glass Gooch crucible, previously record its weight.

Take a sample of the filtered for subsequent analysis and then wash the lignin to remove the residual acid solution.

Can be used **0.45 µm** MCE membrane filter.

Lignin will be retained into the glass Gooch crucible.
Carbohydrates will be soluble in the filtered. To determinate the carbohydrate concentration [To calculate cellulose and hemicellulose content], the sample should be analyzed by HPLC.

8 Dry until constant weight a glass Gooch crucible [or MCE membrane filter] with lignin. Determine lignin content by the difference in weight.

Citation: Magdiel Lainez (04/29/2021). Determination of lignin in lignocellulosic biomass. https://dx.doi.org/10.17504/protocols.io.bumtnu6n

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