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Measuring Biofuel Using Electronic Measure

Biomass - Ethanol Production

Method

1. Collect different samples of biomass (eg. cardboard, paper, dried grasses, leaves etc)
2. Grind samples to increase biomass surface area using a coffee or spice grinder.
3. Label test tubes (with screw top lids or stopper) & choose controls.
4. Weigh approx 1 g of biomass and add it to the test tube and then add 25mL of water. Shake well.
5. Boil the samples to loosen the plant cell wall using either a water bath or a beaker on a hotplate. This makes the cellulose more accessible.
6. Add the cellulase enzyme (small amount) to break down the cellulose into glucose. Shake well.
7. Store in a warm water bath overnight to allow the enzyme to activate.
8. To pause the experiment at any time, put the test tubes in the fridge.
9. Add approx 1g dry baker's yeast. Shake well and loosen the cap so pressure doesn't build up during fermentation. Yeast will breakdown glucose to ethanol & carbon dioxide.
10. Before and after each step tale measurements of glucose (using a standard blood glucose meter) and ethanol (PASCO PASPORT Ethanol Sensor)
11. Compare different biomass samples.

PASPORT Ethanol Sensor
PS-2194 $439 ex GST

& Airlink
PS-3200, $179 ex GST

SPARKvue (Software)
Free download for Android, iOS & Chromebooks or Site License
PS-2400, $395 ex GST

Cellulase
100ml, $87 ex GST

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