Contents

1 Lab 1

1.1 Experimental Setup

Procedure

1.

2.

3.

Variables

- Control:
  - Output voltage on function generator: 10V.
  - Probes 180º from each other. Sense leads 30º from the probe and 180º from each other. See Figure 1.2.
  - Gain $\frac{R_3}{R_2} = \frac{15k}{150} = 100$.
  - Liquid volume 250 ml, 60mm height measured from inside the cup.
- Independent: Frequency.
- Dependent: Voltage peak-to-peak

Considerations Due to a limited power input into the amplifier, a gain ratio of 1000 led to *gain saturation*, where we no longer observed the expected amplification.

Although we define probe orientation, there are two factors we are disregarding: the cup is not perfectly cylindrical, and the leads are not straight – so the distance between electrodes is smaller than what the experimental setup implies.

With gain of 10, the maxima appeared in different frequencies as to those of 100 and 1000. Suspect to be related to the percentage error being too large.

1.2 Raw data

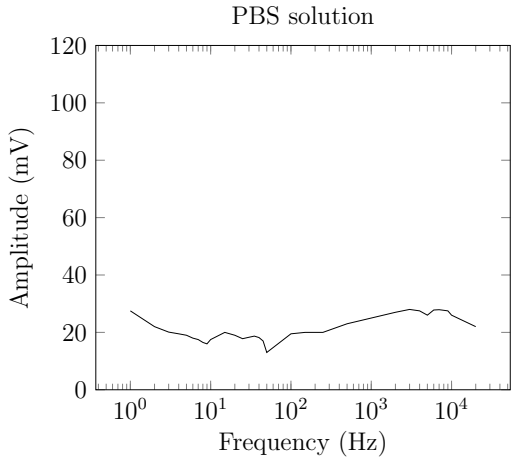

Figure 1: Amplitude based on frequency. Note the dip at 50 Hz due to the filter.

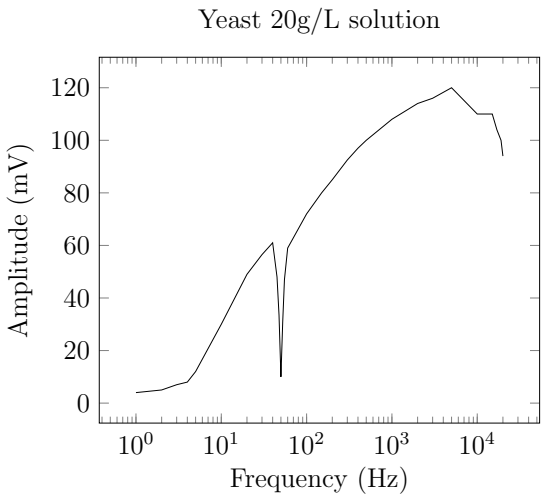

Figure 2:

1.3 Analysis

PBS numbers must be compared to yeast to tell us something meaningful regarding the frequency. At the moment, there is not much we can do.

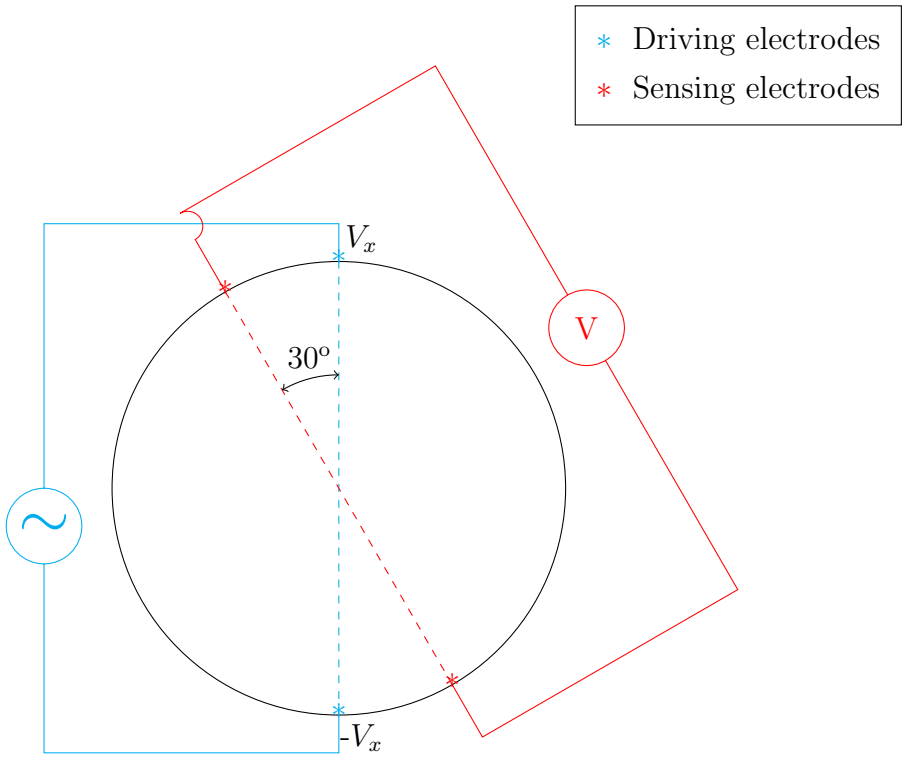

Figure 3: Orientation of electrodes

2 Lab 2

1. Amplitude vs Frequency: 20g/l solution

2. Calibrate amplitude with yeast solutions (1%, 2%, 4%, 10%, 20%)

3 Lab 3