

# Habib University

iSciM

Fall 2023



## ENER 104L RENEWABLE ENERGY

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### LABORATORY REPORT 1

Global Warming

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# 1 Objectives

- Understand effect of various factors in our atmosphere.
- Understand that excess CO<sub>2</sub> intensifies the greenhouse effect
- Why is greenhouse effect important and what does it have to do with climate change?
- Does greenhouse gases really make the temperature rise?

# 2 Abstract

This report explores the greenhouse effect's impact on Earth's atmosphere, taking into consideration of natural and human factors that fuel global warming. A strong emphasis is created to reduce global warming pollution, this is done with the aid of practical experiments to us understand these complex processes. Part A focuses on dissecting the causes of global warming, with emphasis on the role of greenhouse gases. A hands-on experiment, based on a climate change by modeling our earth, is conducted to measure temperature fluctuations, so that we can foster a tangible understanding of this critical environmental issue. Part B delves into photosynthesis and respiration in plants, this experiments aids to quantify carbon dioxide and oxygen exchange. This helped us understand how life itself interacts with the environment, and enabled us to grasp a better concept of Earth's ecosystems and the difficulties it faces. Overall, this report aims to provide a comprehensive understanding of the greenhouse effect and its impact on our planet.

# 3 Result and Analysis

## 3.1 Part I: The Greenhouse Effect

### 3.1.1 Temperature Graphs

### 3.1.2 Temperature Table

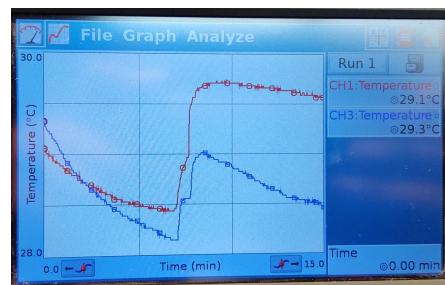
Table 1: Temperature Table

	Covered Jar (°C)	Uncovered Jar (°C)
min	28.4	28.1
max	29.7	29.3
mean	29.1	28.6
st. dev	0.51668	0.26998

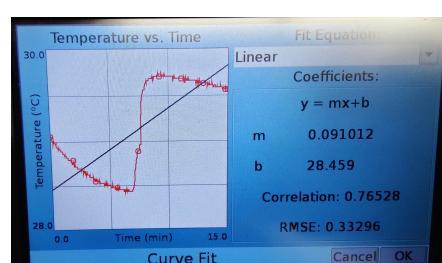
## 3.2 Part II: Photosynthesis and Respiration

### 3.2.1 Covered Jar

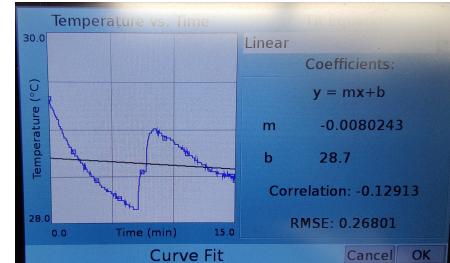
#### CO<sub>2</sub> and O<sub>2</sub> Graphs



(a) Combined

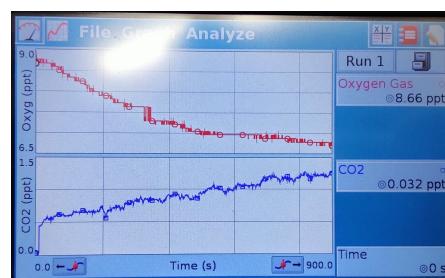


(b) Covered Jar

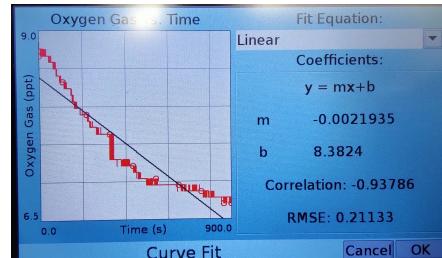


(c) Uncovered Jar

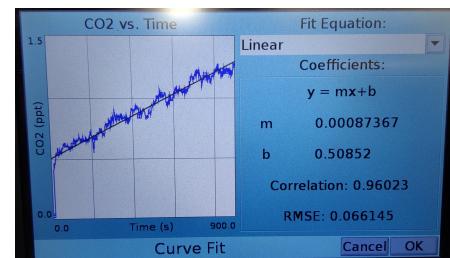
Figure 1: Temperature Graphs



(a) CO2 and O2



(b) O2



(c) CO2

Figure 2: Covered Jar

## 4 Conclusion

abc

## 5 Questions To Ponder

### 5.1 Part A:

1. Explain with reasons which beaker covered or uncovered has the greatest temperature change?

	Covered Jar (°C)	Uncovered Jar (°C)
min	28.4	28.1
max	29.7	29.3
mean	29.1	28.6
st. dev	0.51668	0.26998

Table 2: Experimental result for First order low pass filter

					temp2
Chybovost	%				
10	10	10	10	10	10

2. Which beaker has the greatest rate of temperature change and why?
3. What is slope and the rate of reaction?
4. Why might the greenhouse effect be a problem for our earth?
5. Did the model greenhouse warm faster or slower than the control? What do you think caused the difference?
6. Describe one advantage of using a greenhouse.

## 5.2 Part B:

1. Were either of the rate values for CO<sub>2</sub> a positive number? If so, what is the biological significance of this?
2. Were either of the rate values for O<sub>2</sub> a positive number? If so, what is the biological significance of this?
3. Do you have evidence that photosynthesis occurred in leaves? Explain.
4. Do you have evidence that respiration occurred in leaves? Explain.

Table 3: Experimental result for Second order low pass filter

$V_{in}(mV)$	$f$	$V_2(mV)$	(I.L)dB	Phase ( $\phi$ )
5760	100 Hz	1190	-13.70	-5°
5730	200 Hz	1160	-13.87	-11°
5630	500 Hz	1070	-14.42	-21°
5320	1 kHz	849	-15.94	-38°
4930	2 kHz	560	-18.89	-65°
4830	5 kHz	265.1	-25.21	-74°
4780	10 kHz	123.86	-31.73	-77°
4700	20 kHz	32.55	-43.19	-79°
4700	50 kHz	7.7	-55.7	-83°
4700	100 kHz	2.29	-63.26	-85°