****

**E**astern **M**editerranean **U**niversity

**D**epartmentof **M**echanical **E**ngineering

**L**aboratory **H**andout

**COURSE: Thermodynamics I** (**MENG245) –Group 2**

**Semester: Fall (2019-2020)**

**Name of Experiment:** Absolute Zero of Temperature

**Laboratory date:** 24th October 2019, Thursday at 4:30 pm (Check the place/time with the lab assistant)

**Lab Assistant: Mohamed Alibar** (e-mail: alibar.mohamed@gmail.com)

**Instructor: Asst. Prof. Dr. Devrim Aydin** (e-mail: devrim.aydin@emu.edu.tr)

Submitted by:

Student No:

Group No:

Date of experiment:

Date of submission:

------------------------------------------------------------------------------------------------------------

**EVALUATION**

|  |  |
| --- | --- |
| **Activity During Experiment & Procedure 30 %** |  |
| **Data , Results & Graphs 35 %** |  |
| **Discussion, Conclusion & Answer to Questions 30 %** |  |
| **Neat and tidy report writing 5 %** |  |
| **Overall Mark** |  |

**Honor Pledge:**

**By electronically submitting this report I pledge that I have neither given nor received unauthorized assistance on this assignment.**

\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_   
 Date Signature

1. **CONCEPT**
   1. **PURPOSE**

The Absolute Zero Apparatus is used to experimentally determine the temperature of absolute zero (in degrees Celsius). Absolute zero, by definition, is the point at which a gas exerts zero pressure. The Absolute Zero Apparatus consists of a Fast Response Temperature Sensor and plastic tubing (with pressure connector) mounted into a hollow copper sphere. When the sphere is submerged in a water bath and connected to a temperature sensor, pressure sensor, it will display the temperature and pressure.

* 1. **THEORY**

For an ideal gas, the absolute pressure is directly proportional to the absolute temperature of

the gas.



Thus a plot of temperature vs. pressure will result in a straight line.



The slope of the line depends on the amount of gas in the thermometer, but regardless of the amount of gas, the intercept of the line with the temperature axis should be at absolute zero. If we instead plot the temperature in degrees Celsius, the intercept will not be zero, but rather the temperature of absolute zero in degrees Celsius.

1. **REQUIRED EQUIPMENT**

* Absolute Zero ApparatusManometer
* Boiling, Iced and room temp water

1. **OBSERVATIONS AND READINGS**

|  |  |  |
| --- | --- | --- |
|  | **Temp** | **Pressure** |
| **Ice water** |  |  |
| **Tap water** |  |  |
| **Room Temp water** |  |  |
| **Boiling water** |  |  |

1. **CONCLUSIONS AND RESULTS**