Carnot Cycle Exercise

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March 27, 2023

$T_H = 490$ K
$V_c = 1.90 \times 10^{-3}$ m^3

1. Purpose

The goal of the exercise is to perform various calculations related to the Carnot cycle.

2. Derivations

2.1. Temperature–Volume Relationship for Adiabatic Process

Given:

$$PV = nRT$$
$$p_i V_i^{\gamma} = p_f V_f^{\gamma}$$

$$\begin{aligned} p_i V_i^{\gamma} &= p_f V_f^{\gamma} \\ p_i V_i V_i^{\gamma-1} &= p_f V_f V_f^{\gamma-1} \\ nRT_i V_i^{\gamma-1} &= nRT_f V_f^{\gamma-1} \\ T_i V_i^{\gamma-1} &= T_f V_f^{\gamma-1} \end{aligned}$$

3. Results

4. Conclusion

[1] Karen Schnurbusch, *Physics 4B Lab Book*, Mt. San Antonio College, 2023, pp. 35-38.
[2] Karen Schnurbusch, *Physics 4B Equations*, Mt. San Antonio College, 2023, pp. 1-3.