

Report Sheet:

Thermochemistry

CHEM 111 / 154



**CAPILANO
UNIVERSITY**

Department of Chemistry

LAST NAME: _____ SEC # _____ LOCKER # _____

FIRST NAME: _____ DATE: _____

Name of Partner: _____

RAW DATA

- record all data in blue or black ink only and in the proper format.
- report all temperatures in both tables to 2 decimal places.

Part 1

Part 2

Part 3

initial temperature of
calorimeter + contents

T_{init}:

°C

°C

°C

concentration of
standardized HCl:

1.799 M

NA

NA

mass of empty vessel plus...→

NA

Mg:

MgO:

g

g

mass of vessel after transfer:

g

g

RESULTS

Part 1

Part 2

Part 3

mass of solid Mg or MgO
delivered to calorimeter:

NA

g

g

Use the plotted thermograms to graphically determine T_{inst} . Then calculate ΔT for each Part.

extrapolated temperature of
calorimeter + contents

T_{inst}:

°C

°C

°C

temperature change

ΔT :

K

K

K

Part 1 – Calorimeter Calibration

Calculate number of moles of limiting reagent:

(Report your answer to 4 significant figures.)

_____ mol

Calculate and report the calorimeter constant:

(Report your answer to at least 4 significant figures and carry this through to the calculations in Parts 2 & 3.)

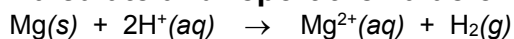
CALORIMETER CONSTANT = _____ kJ/K

Part 2 – Reaction of Magnesium with Acid

Calculate number of moles of Mg: *use the correct number of significant figures for all answer below*

_____ mol

Calculate and report the value of ΔH for this reaction:



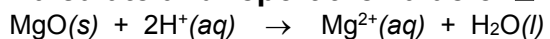
$\Delta H_1 =$ _____ kJ/mol

Part 3 – Reaction of Magnesium Oxide with Acid

Calculate number of moles of MgO:

_____ mol

Calculate and report the value of ΔH for this reaction:



$\Delta H_2 =$ _____ kJ/mol

Hess's Law: Calculation of $\Delta H_f(\text{MgO})$


Use Hess's Law with the above ΔH values to calculate an experimental value for the enthalpy of formation of magnesium oxide:

experimental $\Delta H_f(\text{MgO})$ _____ kJ/mol

Report the **literature value** for $\Delta H_f(\text{MgO})$ and calculate the **% difference**:

literature $\Delta H_f(\text{MgO})$ _____ kJ/mol

percent difference _____ %