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| **Name:** |  |

**Heat of Neutralization**

**Lab Report**

## **LibreTexts page:** [5: Calorimetry](https://chem.libretexts.org/Courses/University_of_Arkansas_Little_Rock/Chem_1402%3A_General_Chemistry_1_(Belford)/Laboratory/05%3A_Experiment_5_-_Calorimetry)

## **(**<https://chem.libretexts.org/link?214682>)

**Please don’t edit, rearrange or delete anything that is already in this document. Just add your answers.**

**You can use shortcuts for superscripts and subscripts when needed:**

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You can obtain the data from this Google sheet → [**Insert the link**]

**Part I: The reaction**

1. Write the balanced equation.

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1. You mixed 30ml 2M NaOH with 30ml 2M HCl. Are these in stoichiometric proportions or is there a limiting reagent?

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1. Predict the moles of NaCl

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**Part II: Obtaining the ΔT from the graph**

1. Obtain TH by using the Google sheet to extend a linear trendline of your data to the time of mixing and consider that point to be your highest temperature point.

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1. Take a snapshot of your graph and replace the picture below with it.

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**Part III: The heat of reaction**

1. What is the total mass of the solution after mixing.

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1. Using the temperature change obtained in part II calculate the heat absorbed by the solutions. Consider these solutions to have the specific heat capacity as pure water.

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1. Calculate the heat absorbed by the calorimeter using the calorimeter constant of 24.6 J/C (that was calculated before class).

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1. Using the first law show how the heat released by the reaction in part I was the heat absorbed by the solution and the calorimeter constant.

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**Part IV: Molar heat of reaction**

1. Using the equation in Part I, calculate the number of moles responsible for the heat released in Part III.

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1. Calculate the numerical value of the molar heat of reaction in units of kJ/mol

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**Part V: Theoretical molar heat of reaction**

1. Using the following enthalpies of formation calculate the theoretical molar enthalpy of neutralization for the reaction of the HCl and NaOH

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| Substance | kJ/mol |
| NaCl(aq) | -407.3 |
| H2O(l) | -285.8 |
| HCl(aq) | -167.2 |
| NaOH(aq) | -470.1 |

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**Part VI: Percent error**

1. Using the equation below, calculate percent error.



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