Hess's Law Lab: Determine the Heat of Formation of Magnesium Oxide

Lab Report

Objective: Write an appropriate objective that mirrors the main conclusion.

Reactions (3)

Data Table: - all data taken, but you do not have to include all of the times-temperature values. You DO need to show the initial and equilibrium temperatures. You also need to include the reference "correct" values given in class, as part of your data. Both sets of data (data from both reactions) should be in this section; DO NOT set up the data as if this were two separate lab reports. If you include results in your data table, points will be deducted.

Calculations: One sample for each type of calculation for EACH reaction.
There should be a header for each type of calculation, and then a verbal for each type of calculation. IF the verbal is the same for BOTH reactions, then you only need to write it once. We are half way through the semester. You need to follow these instructions explicitly. If you want to discuss the format with me BEFORE the due date of the report, you can do that through email or office hours.
DO NOT include more than 2 trials per calculation or points will be deducted. Show the answers to all 6 trials in the results table which is separate from the data table, and comes after the calculations section. Points will be deducted if you format your report differently.

Calculations include – again one calculation using Trial 1 data in part 1 and one using Trial 1 data from part 2:

- change in temperatures (ΔT)
- heat of reaction
- molar heat of reaction
- average molar heat of reaction
- average deviation
- ΔH_f° of $MgCl_2$, kJ/mole (experimental)
- % error of ΔH_f° of $MgCl_2$, kJ/mole from literature value given in class.

- To find the ΔH_f° of MgO, kJ/mole (experimental), use Hess's Law. You will have gotten your target reaction (ΔH_f° reaction of MgO) by the end of the lab. You will need ONE more reaction, which you will be able to figure out, given the other two reactions plus the target reaction. You will use the text book value (from the appendix in the text) for this reaction. Using Hess's Law and your AVERAGE numbers from the experimental data for reactions 1 and 2, determine the heat of reaction of the target reaction. No credit will be given for "products – reactants" method.
- Show the complete solution for the Hess's Law calculation.
- % error of ΔH_f° of MgO, kJ/mole from literature value given in class.

Results Table: Put all of the results (answers to all calculations above) for all 6 trials in this table. For the Hess's Law calculation, just enter the one, final ΔH_{rxn} for the results table, and then the % error from the literature value.

Discussion: Discuss any errors or difficulties from this experiment.

Conclusion: Re-state in sentence form, the most important results listed in the results table. The numbers should be stated as "17 " not "seventeen". Also, percent errors associated with the main results should be incorporated in context. (Do not list % errors separately, but next to the result that each describes).

If you have any questions about formatting or what exactly is meant, please ask!