Heat of combustion of magnesium lab report

Refer to the lab's help titled, Reaction Heat for Magnesium Oxide Formation. Can we help you with your assignment? Let's do your homework! Professional writers are available in all subject areas and will meet your assignment deadline. Free correction and copy editing included. Planning B: Refer to the lab guide titled Reaction for Magnesium Oxide Formation. Data Collection: Quantitative Table I: Compound Trial Mass±0.001g Volume of HCl±0.5mL Temperature of HCl±0.5°C Time (seconds) Temperature of solution±0.5°C MgO 1 1.020 100.0 21.0 23.0 15 27.0 30 30.0 45 30.0 60 30.0 75 30.0 90 30.0 2 1.078 99.0 21.0 23.0 15 27.0 30 29.0 45 29.0 60 29.0 75 29.0 90 29.0 25.0 Mg 1 0.542 99.0 22.0 15 31.0 30 41.0 45 45.0 60 46.0 75 46.0 90 46.0 105 45.0 2 0.532 99.0 20.0 21.0 15 32.0 30 40.0 45 43.0 60 44.5 75 44.5 90 44.5 105 44.5 120 44.5 Qualitative Table I: Compound Before During After MgO MgO is small, white granular pieces, a fine white powder. HCl is bright and smells a bit. sour smell . confusing steaming . A gas starts to form, just a little bit. Feel the solution getting hotter while doing the experiment. too hot . MgO is completely dissolved in HCl. The new solution is bright and odorless despite the previous smell of HCl. milligrams of small grey patches such as shiny little HCl stones are bright and smell little. sour smell . confusing steaming . A lot of gas is forming. Feel the solution getting much hotter while doing the experiment. Extremely bizarre. A lot of bubbles are forming. Bad smell is carried out as mg and HCl mixtures. Mg is completely dissolved in HCl. The new solution is clear. There is a very strong and bad smell. It almost smells like rotten eggs but not as strong. Data analysis: So the mean high temperature for MgO and HCl solution in the trial was 30.0ºC. So the mean high temperature for MgO and HCl solution in the trial was 46.0ºC. Therefore, the mean high temperature for MgO and HCl solution in the trial was 29.0ºC. Therefore, the mean high temperature for Mg and HCl solution in the trial was 44º5.2 C for data processing: Discussion: This study was conducted to determine the enthalpy of magnesium oxide formation by manipulating the three given equations. Through testing, it was found that the enthalpy change for magnesium combustion is -593.3KJ/mol and the thermo chemical equation (target equation) is for magnesium combustion (see right). Obviously, the two equations used in this experiment were extrathermic since the enthalpy of the change that led to a negative value, so the experiment was successful. In addition, the results are quite accurate as the value reached through the experiment, -24410.6 KJ/Kg, very close to the theoretical value, -25020KJ/Kg, which is seen through a low percentage error of only 2.4%. Because percentage error is a very small value It is apparent that the experiment was a success, however that doesn't mean it was perfect. The sources of error in this case would have been quite minimal as a result of the small change that resulted in a slightly lower amount of expected value. One of the errors that may have caused the enthalpi lower than expected would have been that the heat escaped from the calorie meter used during the experiment. There were two holes on the calorimeter door and one used for the grader, however the latter, although very small, remained open. These holes could have allowed the heat to escape as the reaction was taking place, which could have reduced the value of the final temperature. What's more, is that the door was as tight as it could have simply ran onto the container that used as calorie meters and not the air tight, which could also let some heat escape. Both of these conditions resulted in lower final temperature values. As a result, the value of heat, or Q, was lower, which also led to lower enthalpi value, such as the amount found. However, given the small sizes of the holes and the security of the door it is unlikely that a large amount of heat would have escaped which is why only one minimal change occurs, much like in the case of this experiment. To avoid even the smallest anomalies, in the future any hole in the calorimeter can be covered with tape or another item that can block the crossing. The top of the calorimeter could also be covered with aluminum, this would not only cover the holes but also secure the space under the door so any heat that might escape would remain inside the area because of aluminum. Aluminum can also be tucked in space between doors and calorie meters for once again heat locks in. In this way, the calorie meter will be more effective and will maintain all the heat of the reaction from the amounts that are quite accurate and reduce even the slightest errors. Another difference that may have occurred during the experiment was that the magnesium bar may have reacted before pouring into the calorie meter with oxygen in the air. This error will only be specific to magnesium because magnesium oxide has already reacted with oxygen and no other reaction will occur. The test method states that HCl is supposed to be measured first, and then magnesium is not emphasized the importance of this step, and therefore in one group two, like one for this experiment, it was broken down step by two because one partner handles magnesium and the other handles HCl. So as magnesium was carrying from the measuring area to the work station or while it was sitting on top of the counter or was pouring, it would have reacted with oxygen in the atmosphere and ignition. As a result, this led to a decrease in the mass of magnesium, a crime unknown at the time. This would have led to lower The value for the reaction and when the calculation was made for heat (Q) the lower temperature could have resulted in a lower value for the reaction heat, as it is calculated using Q=mc t. Once again, the change that was occurring was minimal because it is difficult to react with oxygen in such a short time without using catalysts for large quantities of magnesium. However, this explained the small error in the experiment because the inconsistencies were not so great. In the future, this method should emphasize the importance of measuring and pouring magnesium after measuring HCl and pouring into calorie meters, preventing other reactions. Electronic equilibrium, or any balance, should be placed at the work station and should be poured into the calorie meter immediately as soon as the proper amount of magnesium is measured. The likelihood of a reaction will definitely decrease because the calorie meter and balance will be near each other. The final error that may have occurred during the experiment was the loss of heat during the shedding stage. It is apparent that the reactions all began immediately, seeing they were very short, between 90-120 seconds. This meant that the heat was immediately being produced and the lid was not on the calorie meter to prevent the heat from escaping. Once again, heat loss resulted in lower enthalpi amounts. In the future to prevent this, a partner who does not shed magnesium should keep the lid close to the calorie meter and only open it at a small angle so that there is only enough space for the other partner to pour in magnesium or magnesium oxide. When all it is poured in the door should be broken immediately. Although this does not stop the heat completely from escaping it certainly reduces the amount that can escape. So the inconsistencies in the experiment, however small, could have resulted in less value than expected, leading to a low percentage error. Error.