Name __________________________

Purpose: to determine the heat of combustion of a snack food experimentally to compare experimental results to accepted values

Procedure
1. Set up ring on ring stand.
2. Measure mass of empty can.
3. Fill can with between 90 and 110mL of water. Measure mass of can with water.
4. Hang can from ring.
5. Impale fresh Cheeto on rubber stopper with dissection pin.
6. Measure mass of unburned Cheeto on rubber stopper with dissection pin.
7. Set up Cheeto under can of water. Can should be roughly one inch above Cheeto.
8. Measure initial temperature of water.
9. Set fire to Cheeto. Let Cheeto burn until it burns itself out.
10. Stir water with thermometer while Cheeto burns. Measure highest temperature reached by water.
11. Measure mass of burned Cheeto on rubber stopper with dissection pin.
12. Clean up Cheeto (do NOT eat it, c'mon) mess.
13. If time allows, repeat experiment a second time.

Data

<table>
<thead>
<tr>
<th>Water</th>
<th>Cheeto (and stopper and pin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mass of empty can</td>
<td>mass of unburned Cheeto, stopper, &amp; pin</td>
</tr>
<tr>
<td>mass of can and water</td>
<td>mass of burned Cheeto, stopper, &amp; pin</td>
</tr>
<tr>
<td>initial temp of water</td>
<td>Calories per Cheeto serving (from label)</td>
</tr>
<tr>
<td>highest temp of water</td>
<td>mass of Cheeto serving (from label)</td>
</tr>
</tbody>
</table>

Calculations
Energy gained by water ______________________________ (work below)

Energy lost by Cheeto ________________________________

Energy lost by Cheeto per gram burned (experimental) __________________________ (work below)

Energy in Cheetos converted from Calories to kilojoules ______________________ (work below)
Energy in Cheetos per gram (from label – accepted value) __________________ (work below)

Percent error of energy per gram of Cheeto __________________ (work below)

Questions
1. What assumption did you make about the energy in your calculations?

2. Why is that assumption not necessarily a good one in this case?

3. If the heat of combustion for the Cheeto were instead measured in a bomb calorimeter (p ___), would you expect your experimental heat of combustion to be higher or lower than what you found? Why?

4. Without buying a bomb calorimeter, how could the lab setup be changed to get better results? Make the suggestions reasonable within our limited lab supply budget.

Conclusion