Chemistry 12: Energy Content of a Dorito

Pre-Lab Questions

1. Find the energy content of the type of Dorito you are testing. Be mindful of the units.
2. Convert this value in the standard metric units oi J/g.
3. Using your knowledge of calorimetry solve the following practice problems:
   1. A 15.7 g piece of iron absorbs 1086 J of heat energy, and its temperature changes from 25.0°C to 175°C.  Calculate the specific heat capacity of iron.
   2. To what temperature will a 50.0 g piece of glass raise if it absorbs 5275 J of heat, and its specific heat capacity is 0.50 J/g°C?  The initial temperature of the glass is 20.0°C.
   3. A King, the character is very fussy about his bathwater temperature. It had to be exactly 38.0o C. You are his butler, and one morning while checking his bath temperature, you notice that it’s 42.0oC. You plan to cool the 100.0 kg of water to the desired temperature by adding a cold chunk of aluminum at a temperature -24.0oC. Of what mass should the Aluminum chunk be? [Specific heat of Al = 0.900 J/(goC)]. Assume that no heat is lost to the air.
   4. A 50.00ml sample of 0.500 mol/L MgSO4 solution at 24.4°C is added to 50.0mL of a 0.500 mol/L Ba(NO3)2 solution at 24.4°C. The temperature of the mixed solution rises to 26.3°C.  Write a balanced chemical reaction with states of matter and calculate the heat of the reaction (in kJ).  *Assume the density of the resulting solution is 1.00 g/mL*
4. As a group investigate the materials presented and formulate an experimental design to determine the energy content of a Dorito. Briefly describe it below.
5. What kind of data will you collect and how will it be orgainzed?
6. How will you calculate the energy content of a Dorito? What units and formulas will you use?
7. Do you think your findings will be greater than or less than the advertised energy content? Explain.