Name	Date	

Bomb Calorimetry

The data for the following problem was obtained using the bomb calorimeter that will be used in the class demonstration to determine the molar heat of combustion of naphthalene.

A class wished to determine the molar heat of combustion of naphthalene ($C_{10}H_8$) using bomb calorimetry. They first needed to determine the heat capacity of the bomb. They chose benzoic acid as the reference compound and obtained the following data:

Mass of water used 2000. g mass of benzoic acid used 0.9383 g Final water temperature 24.535° C heat of combustion 26,450 J/g Initial water temperature 22.067° C

1. Calculate value of C, the heat capacity, for the bomb in $J/^{\circ}C$.

2. Another student, using the same bomb as in number one above, burned 0.9754g of naphthalene $C_{10}H_8$), using 2000g of water to absorb the heat and found a temperature increase of 3.842 C. Using the bomb constant calculated above, find the heat of combustion (in kJ/mole) of naphthalene $C_{10}H_8$).