WS 2 - Calorimetry

1. Calculate the heat lost (ΔrH) in a chemical reaction which causes 250 g of water to increase in temperature by 12.0°C.

2. The combustion of 0.500 g of carbon causes the temperature of 100 mL of water in a bomb calorimeter to rise from 20.10°C to 59.20°C. Calculate the molar enthalpy of combustion of carbon in kJ/mol.

3. A 12.7 g sample of sulphur, $S_{8(s)}$, is placed in a bomb which is then filled with oxygen under pressure. The bomb is placed in the calorimeter which is filled with 2.20 kg of water at 21.08°C. The reaction mixture is ignited and the temperature rises to 33.88°C. Calculate the molar heat of combustion of sulphur in kJ/mol.

4. A student mixed 100.0 mL of 1.50 mol/L sulphuric acid with 200.0 mL of 1.50 mol/L sodium hydroxide. Both solutions were at 19.67°C initially and the highest temperature reached by the reaction mixture was 34.06°C. Calculate the molar enthalpy of neutralization for sulphuric acid in kJ/mol.