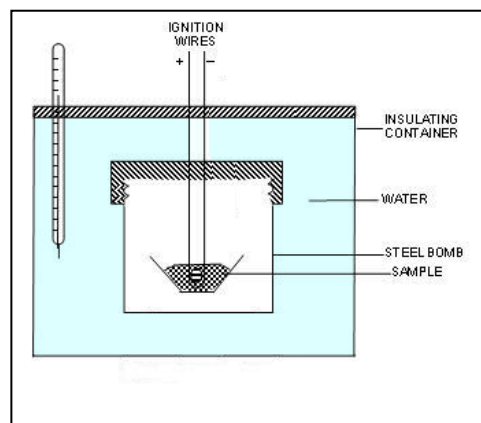


Friday Worksheet

Name: .....

Enthalpy worksheet 6

- 1) Students were investigating energy transformations in redox reactions. This involved adding a known mass of chlorine gas to excess hydrogen gas in a bomb calorimeter and then measuring the temperature change of 150.0 mL of water.

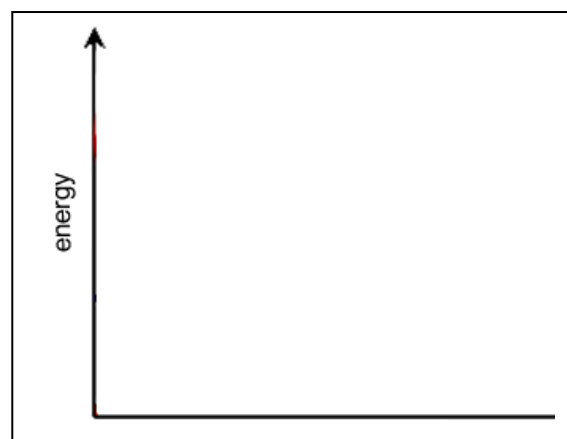


Mass of chlorine gas used	7.10g
Initial temperature of the water	20.0 °C
Temperature of the water after the reaction's completion	49.4 °C

- (a) Using the information above and assuming no energy loss from the system, calculate the  $\Delta H$  of the equation below.



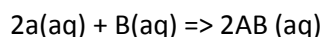
- b) Given that the energies needed to break the bonds of H-H is 436 kJ/mol and Cl-Cl is 242 kJ/mol draw an energy profile for the reaction above.



- c) On the same set of axes draw the energy profile when a catalyst is used that lowers the activation energy by two thirds.

- d) What is the activation energy for the catalysed reaction  $2\text{HCl}(\text{g}) \Rightarrow \text{H}_2(\text{g}) + \text{Cl}_2(\text{g})$

- e) Consider the energy profile shown on the right. It represents the reaction given by the equation below.



- What is the energy given out during bond formation
- What is the energy absorbed during bond breaking
- What is the  $\Delta H$  of the reaction.
- On the same set of axes draw the energy profile of the reaction given by the equation  $\text{a}(\text{aq}) + \frac{1}{2} \text{B}(\text{aq}) \Rightarrow \text{AB}(\text{aq})$

