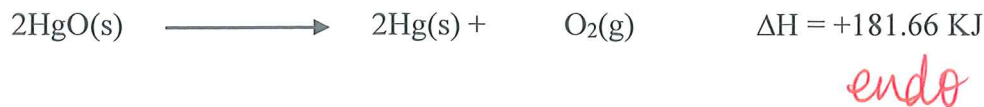
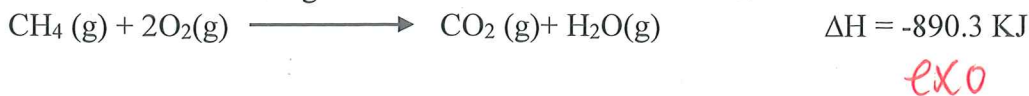


# Thermochemistry/Practice-Thermochemical Equations and Stoichiometry

Name: Kel

Show all the work for the calculations and give the answers in the correct significant figures.

- 1) Indicate if the following reactions are endo or exothermic.



- 2) Given equation (a) below, calculate the  $\Delta\text{H}$  for equation (b). (Ans: -26.48 KJ)



*( $\Delta\text{H}$ ) reverse and  $\div 2$*

- 3) Given equation (a) below, calculate the  $\Delta\text{H}$  for equation (b). (Ans: +142.7 KJ)



*( $\Delta\text{H}$ ) divide by 2*

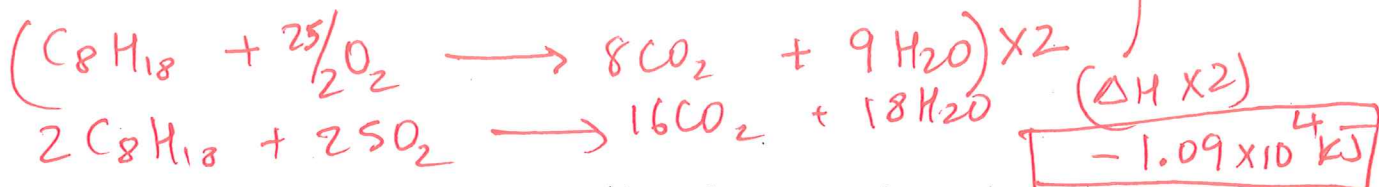
- 4) Write the thermochemical equation that expresses that at  $0^\circ\text{C}$  ice melts by absorbing 334 J of heat per gram. (Ans: +6.02 KJ)



$$\frac{334 \text{ J}}{\text{g}} \times \frac{18 \text{ g}}{1 \text{ mol}} \times \frac{1 \text{ kJ}}{1000 \text{ J}} = \boxed{6.02 \text{ kJ}}$$

- 5) The complete combustion of liquid octane,  $\text{C}_8\text{H}_{18}$ , produces carbon dioxide and water at  $25^\circ\text{C}$  and at constant pressure, it gives 47.9 kJ of heat per gram of octane. Write the thermochemical equation to show this information. (Ans:  $-1.09 \times 10^4 \text{ KJ}$ )  *$\text{C}_8\text{H}_{18} = 114.2 \text{ g/mol}$*

$$\frac{-47.9 \text{ kJ}}{1 \text{ g } \text{C}_8\text{H}_{18}} \times \frac{114.2 \text{ g } \text{C}_8\text{H}_{18}}{1 \text{ mol}} = -5.47 \times 10^{-3} \text{ kJ/mol.}$$



6) Answer the following two questions using the equation given below.



a) What is the enthalpy change associated with the formation of 5.67 mol HCl gas in the following reaction? (Ans: -523 KJ)

$$5.67 \text{ mol HCl} \times \frac{-184.6 \text{ kJ}}{\text{mol}} = \boxed{-523 \text{ kJ}}$$

b) What is the enthalpy change when 12.8 g of H<sub>2</sub> gas reacts with excess Cl<sub>2</sub> gas to form HCl? (Ans: -1.17 x 10<sup>3</sup> KJ)

$$12.8 \text{ g H}_2 \times \frac{1 \text{ mol H}_2}{2.016 \text{ g H}_2} \times \frac{-184.6 \text{ kJ}}{1 \text{ mol}} = \boxed{-1.17 \times 10^3 \text{ kJ}}$$