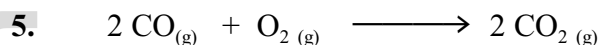
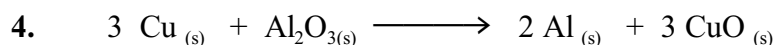
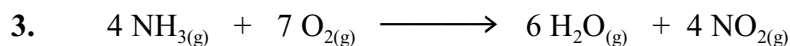
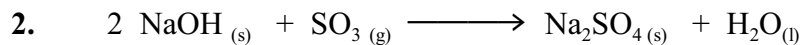
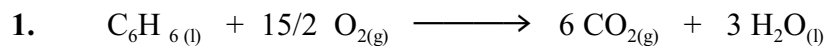


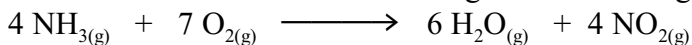
# Standard Heats of Reaction and Hess's Law

Determine the heat of reaction for the following using Hess' Law of Summation of Heat and  $\Delta H_f^0$  values Thermochemical Data Sheet .

$$\text{Enthalpy change for a reaction} = \Delta H^0_{\text{rxn}} = \Sigma [\Delta H^0_f(\text{products})] - \Sigma [\Delta H^0_f(\text{reactants})]$$

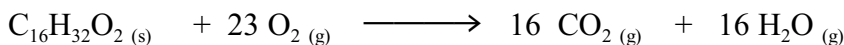


6. When ammonia is oxidised according to the following equation ...



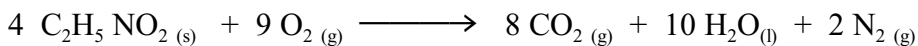
1132.0 kJ are evolved, determine the heat of formation of ammonia,  $\text{NH}_3(\text{g})$ .

7. The molar heat of combustion of palmitic acid,  $\text{C}_{16}\text{H}_{32}\text{O}_2(\text{s})$  is  $-9948.4 \text{ kJ mol}^{-1}$  ...



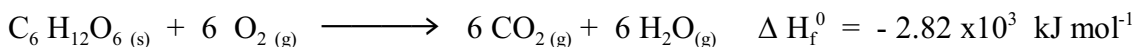
Determine the molar enthalpy of formation of palmitic acid.

8. One of the "building blocks" for proteins such as those in muscles and sinews is amino acid called glycine,  $\text{C}_2\text{H}_5\text{NO}_2$ . The equation for its combustion is ...



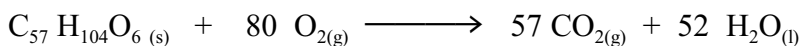
The value of its heat of combustion is  $-973.49 \text{ kJ mol}^{-1}$ . Calculate the heat of formation for glycine.

9. Glucose undergoes combustion according to the following equation ...



Determine the enthalpy of formation for glucose.

10. The reaction that occurs when a typical fat, glycerol trioleate, is metabolized in the body is ...



a) 37.8 kJ is evolved when 1.00 g of this fat (Molar Mass = 884) is metabolized.

Calculate the molar enthalpy of formation of fat in  $\text{kJ mol}^{-1}$ .

b) How many kilojoules of energy must be in the form of heat if you want to get rid of 1.00 pound (454 g) of this fat by combustion?