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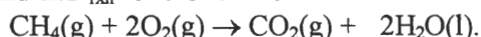
1. (5 Pts) How much heat is given off when 8.95 grams of ethylene (C<sub>2</sub>H<sub>4</sub>) are burned? (C 12.01, H 1.08)  
 $C_2H_4(g) + 3O_2(g) \rightarrow 2CO_2(g) + 2H_2O(l) \quad \Delta H^\circ_{rxn} = -1411 \text{ kJ/mol}$

$$\frac{8.95 \text{ g } C_2H_4}{28.05 \text{ g } C_2H_4} \times \frac{1411 \text{ kJ}}{\text{mol } C_2H_4} = 450 \text{ kJ}$$

2. (3 Pts) The specific heat of silver is 0.235 J/g·°C. How many joules of heat are required to heat a 75 g silver spoon from 20°C to 35°C?

$$\frac{0.235 \text{ J}}{g \cdot ^\circ C} \times 75 \text{ g} \times 15^\circ C = 264 \text{ J}$$

3. (4 Pts) Find  $\Delta H^\circ_{rxn}$  for the reaction



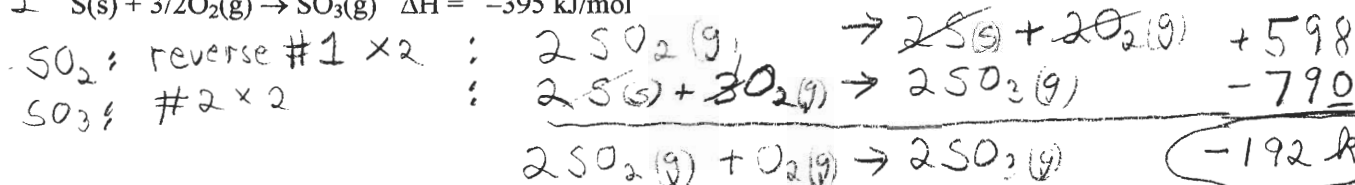
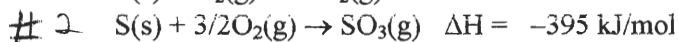
$$[\Delta H^\circ_f(CH_4(g)) = -74.8 \text{ kJ/mol}; \Delta H^\circ_f(CO_2(g)) = -393.5 \text{ kJ/mol}; \Delta H^\circ_f(H_2O(l)) = -285.5 \text{ kJ/mol}]$$

$$\Delta H = (-393.5 + 2(-285.5)) - (-74.8 + 2(0)) = -889.7 \text{ kJ}$$

4. (6 Pts) Calculate the heat released (kJ) in the reaction of sulfur dioxide gas and oxygen gas to form sulfur trioxide gas:



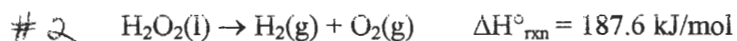
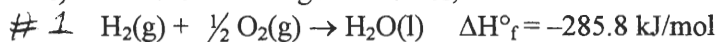
Given:



5. (3 Pts) The reaction that represents the standard enthalpy of formation for acetone (CH<sub>3</sub>COCH<sub>3</sub>), a common ingredient in nail polish remover is:

- (A)  $3C(\text{graphite}) + 3H_2(g) + 1/2O_2(g) \rightarrow CH_3COCH_3(l)$   
 B)  $6C(\text{diamond}) + 6H_2(g) + O_2(g) \rightarrow 2CH_3COCH_3(l)$   
 C)  $3C(\text{diamond}) + 3H_2(g) + 1/2O_2(g) \rightarrow CH_3COCH_3(l)$   
 D)  $CH_3COCH_3(l) \rightarrow 3C(\text{graphite}) + 3H_2(g) + 1/2O_2(g)$   
 E)  $CH_3COCH_3(l) + 4O_2(g) \rightarrow 3CO_2(g) + 3H_2O(g)$

6. (4 Pts) Given the following  $\Delta H^\circ$  values,



calculate  $\Delta H^\circ_{rxn}$  for the reaction  $H_2O_2(l) \rightarrow H_2O(l) + 1/2O_2(g)$ ,  $\leftarrow$  "Goal"  $\Delta H \text{ kJ}$

