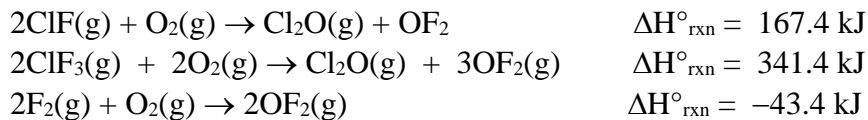
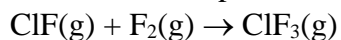


Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Find the standard enthalpy of formation of ethylene,  $C_2H_4(g)$ , given the following data:  
heat of combustion of  $C_2H_4(g) = -1411 \text{ kJ/mol}$ ;  $\Delta H^\circ_f[CO_2(g)] = -393.5 \text{ kJ/mol}$ ;  
 $\Delta H^\circ_f[H_2O(l)] = -285.8 \text{ kJ/mol}$ .  
A) 52 kJ/mol  
B) 87 kJ/mol  
C) 731 kJ/mol  
D)  $1.41 \times 10^3 \text{ kJ/mol}$   
E)  $2.77 \times 10^3 \text{ kJ/mol}$
2. Which of the following processes is *endothermic*?  
A)  $O_2(g) + 2H_2(g) \rightarrow 2H_2O(g)$   
B)  $H_2O(g) \rightarrow H_2O(l)$   
C)  $3O_2(g) + 2CH_3OH(g) \rightarrow 2CO_2(g) + 2H_2O(g)$   
D)  $H_2O(s) \rightarrow H_2O(l)$
3. At  $25^\circ\text{C}$ , the following heats of reaction are known:



At the same temperature, use Hess's law to calculate  $\Delta H^\circ_{\text{rxn}}$  for the reaction:



- A) -217.5 kJ
- B) -130.2 kJ
- C) 217.5 kJ
- D) -108.7 kJ
- E) 465.4 kJ

4. The enthalpy change when a strong acid is neutralized by strong base is  $-56.1$  kJ/mol. If  $135$  mL of  $0.450$  M HI at  $23.15^\circ\text{C}$  is mixed with  $145$  mL of  $0.500$  M NaOH, also at  $23.15^\circ\text{C}$ , what will the maximum temperature reached by the resulting solution? [Assume that there is no heat loss to the container, that the specific heat of the final solution is  $4.18$  J/g $\cdot^\circ\text{C}$ , and that the density of the final solution is that of water.]
- A)  $26.06^\circ\text{C}$
  - B)  $29.19^\circ\text{C}$
  - C)  $32.35^\circ\text{C}$
  - D)  $20.24^\circ\text{C}$
  - E)  $36.57^\circ\text{C}$

## **Answer Key**

1. A
2. D
3. D
4. A