

## Answers to Practice Problems G in page 364

### Answers to Practice Problems G

- $\Delta G = \Delta H - T\Delta S = -76 \text{ kJ} - (298.15 \text{ K})(-0.117 \text{ kJ/K}) = -41 \text{ kJ}$   
Yes, the reaction is spontaneous.
- $\Delta G = \Delta H - T\Delta S = 11 \text{ kJ} - (298.15 \text{ K})(0.049 \text{ kJ/K}) = -3.6 \text{ kJ}$   
Yes, the reaction is spontaneous.
- $\Delta G = \Delta H - T\Delta S = 11 \text{ kJ} - (298.15 \text{ K})(0.041 \text{ kJ/K}) = -1.2 \text{ kJ}$   
The reaction is spontaneous.

### Homework

GENERAL

**Additional Practice** Have students determine the change in Gibbs energy for the following chemical reactions using the changes in entropy and enthalpy values. Remind students that they must multiply a molar entropy and a molar enthalpy by the number of moles of that substance in the reaction. Assume that the coefficients represent the number of moles involved in the reaction.

- $2\text{HgO}(s) \rightarrow 2\text{Hg}(l) + \text{O}_2(g)$  at  $25^\circ\text{C}$  **Ans.  $\Delta G = 111.2 \text{ kJ}$**
- $\text{CO}(g) + \text{H}_2\text{O}(g) \rightarrow \text{HCOOH}(l)$  at  $500^\circ\text{C}$  **Ans.  $\Delta G = -1013.2 \text{ kJ}$**
- $4\text{NH}_3(g) + 5\text{O}_2(g) \rightarrow 4\text{NO}(g) + 6\text{H}_2\text{O}(g)$  at  $25^\circ\text{C}$  **Ans.  $\Delta G = -1008.7 \text{ kJ}$**

 Logical