

Thermochemistry

HW-chapter 6

№	Questions
1	<p>The standard state of an element or compound is determined at a pressure of and a temperature of</p> <p>(a) 760 atm, 0 °C (b) 1 mmHg, 273 °C (c) 760 atm, 0 K (d) 1 atm, 298 K</p>
2	<p>2- Using the following reactions</p> $\text{C(s)} + 2 \text{Cl}_2(\text{g}) \leftrightarrow \text{CCl}_4(\text{l}) \quad \Delta H^\circ = -135.4 \text{ kJ}$ $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \leftrightarrow 2 \text{HCl(s)} \quad \Delta H^\circ = -184.6 \text{ kJ}$ $\text{CH}_4(\text{g}) \leftrightarrow 2 \text{H}_2(\text{g}) + \text{C(s)} \quad \Delta H^\circ = +74.8 \text{ kJ}$ <p>calculate the standard enthalpy of reaction for the process</p> $\text{CH}_4(\text{g}) + 4 \text{Cl}_2(\text{g}) \leftrightarrow \text{CCl}_4(\text{l}) + 4 \text{HCl(g)}$ <p>(a) -152.9 kJ (b) -245.2 kJ (c) -337.5 kJ (d) -429.8 kJ</p>
3	<p>Calculate the specific heat of Freon-12, CCl_2F_2, if it requires 2930 joules of heat to raise the temperature of 89.1 grams of this gas by 55.0 °C.</p> <p>(a) 0.00600 J/g • K (b) 0.598 J/g • K (c) 1.67 J/g • K (d) 2.83 J/g • K</p>
4	<p>4- The standard molar enthalpy change is -1277.3 kJ for the combustion of ethanol.</p> $\text{C}_2\text{H}_5\text{OH(g)} + 3 \text{O}_2(\text{g}) \leftrightarrow 2 \text{CO}_2(\text{g}) + 3 \text{H}_2\text{O(g)}$ <p>Calculate the standard molar enthalpy of formation for ethanol based on the following standard enthalpies of formation: $\Delta H^\circ_f[\text{CO}_2(\text{g})] = -393.5 \text{ kJ/mol}$ and $\Delta H^\circ_f[\text{H}_2\text{O(g)}] = -241.8 \text{ kJ/mol}$.</p> <p>(a) -122.9 kJ/mol (b) -235.1 kJ/mol (c) -642.7 kJ/mol</p>

(d) 122.9 kJ/mol

5 Which of the following processes is *endothermic*?

