Thermochemistry

HW-chapter 6

№	Questions
1	The standard state of an element or compound is determined at a pressure of and a temperature of (a) 760 atm, 0 ºC (b) 1 mmHg, 273 ºC (c) 760 atm, 0 K (d)1 atm, 298 K
2	2- Using the following reactions $C(s) + 2\ Cl_2(g) \leftrightarrow CCl4(l)$ $\Delta H^o = -135.4$ kJ $H_2(g) + Cl_2(g) \leftrightarrow 2\ HCl(s)$ $\Delta H^o = -184.6$ kJ $CH_4(g) \leftrightarrow 2\ H_2(g) + C(s)$ $\Delta H^o = +74.8$ kJ calculate the standard enthalpy of reaction for the process $CH_4(g) + 4\ Cl_2(g) \leftrightarrow CCl_4(l) + 4\ HCl(g)$ (a) -152.9 kJ (b) -245.2 kJ (c) -337.5 kJ **(d)** -429.8 kJ
3	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 ºC. (a) 0.00600 J/g • K (b) 0.598 J/g • K (c) 1.67 J/g • K (d) 2.83 J/g • K
4	4- The standard molar enthalpy change is -1277.3 kJ for the combustion of ethanol. $C_2H_5OH(g) + 3\ O_2(g) \leftrightarrow 2\ CO2(g) + 3\ H_2O(g)$ Calculate the standard molar enthalpy of formation for ethanol based on the following standard enthalpies of formation: $\Delta H°f[CO_2(g)] = -393.5$ kJ/mol and $\Delta H°f[H_2O(g)] = -241.8$ kJ/mol. (a) -122.9 kJ/mol (b)-235.1 kJ/mol (c) -642.7 kJ/mol

	(a) 122.9 kJ/mol
5	When 86.7 grams of water at a temperature of 73.0 ^{o}C is mixed with an unknown mass of water at a temperature of 22.3 ^{o}C the final temperature of the resulting mixture is 61.7 ^{o}C. What was the mass of the second sample of water? (a) 24.9 g (b) 48.2 g (c) 302 g (d) 419 g