KEY

HW #29 p552 # 14, 16, 18 p353 # 22, 28

(14) $2Fe_2O_{3(s)} + C_{(s)} \rightarrow 4Fe_{(s)} + 3CO_{2(g)}$ $\Delta H = ?$

$-824.2\,kJ$ $0\,kJ$ $0\,kJ$ $-393.5\,kJ$

$\Delta H = \Sigma$ products $- \Sigma$ reactants

$= 3(393.5) - 2(824.2)$

$\Delta H = 467.9\,kJ$

$1\,mol\ Fe \times \frac{467.9\,kJ}{4\,mol\ Fe} = 117\,kJ$

(16) $C_6H_{12}O_{6(s)} + 6O_{2(g)} \rightarrow 6CO_{2(g)} + 6H_2O_{(l)}$

$-1263\,kJ$ 0 $-393.5\,kJ$ $-285.8\,kJ$

$\Delta H = \Sigma$ prod $- \Sigma$ react

$= (6(-393.5\,kJ) + 6(-285.8\,kJ)) - (6(0) + 1(-1263\,kJ))$

$= -2813\,kJ$ in one mole (1 : 1267 ratio)

(16) $2C_2H_5OH + 3O_2 \rightarrow 2CO_{2(g)} + 3H_2O_{(g)}$

$-277.0\,kJ$ 0 $-393.5\,kJ$ $-285.8\,kJ$

$\Delta H = [2(-393.5\,kJ) + 3(-285.8)] - (-277.0\,kJ)$

$\Delta H = -1367.4$

(22) (A) $\Delta H_f = 3.811\,kJ/mol$ $q = 83.2\,kJ$

$\Delta H_f = \frac{q}{mol}$

$3.811\,\frac{kJ}{mol} = \frac{83.2\,kJ}{mol}$

$21.8 = mol$

(B) $21.8\,mol \times \text{Molar Mass} = 5519\,g$

$MM = 253\,g/mol$

(28) $\Delta H = \frac{q}{mol}$

$6.009 = \frac{q}{44{,}000\,mol}$

$2.65 \times 10^5\,kJ = q$

$7.95 \times 10^5\,g \times \frac{1\,mol}{18.02\,g} = 44{,}000\,mol$