2、易知：$K=\frac{K_1^\theta}{K_2^\theta}=4\times10^{-8}$

4.(1) $\Delta_rG_m^\theta=-2.303RT\lg K^\theta$

$\lg K^\theta=5.78$

$K^\theta=6.03\times10^5$

(2). $\ln\frac{K_2^\theta}{K_1^\theta}=\frac{\Delta_rH_m^\theta}{R}\left(\frac{1}{T_1}-\frac{1}{T_2}\right)$

解得，$K_1^\theta=7.06\times10^{-5}$

说明温度越高，反应进行的程度越小

(3). $\Delta_rG_m^\theta=\Delta_rH_m^\theta-T\Delta S_m^\theta=-17.73\ kJ\cdot mol^{-1}$

$\Delta_rG_m^\theta=-2303RT\lg K^\theta$

$K^\theta(1473K)=4.25$

$K^\theta=\frac{P_{CO_2}}{P^\theta}=4.25$

$P_{CO_2}=4.25\cdot P^\theta=425kPa$

8.

(1) $\ln\frac{K_2^\theta}{K_1^\theta}=\frac{\Delta_rH_m^\theta}{R}\left(\frac{1}{T_1}-\frac{1}{T_2}\right)$

$K_1^\theta=1.0,\ T_1=298K,\ T_2=773K$

$K_2^\theta=8.96\times10^{18}$

(2) $K^\theta=\frac{P_{NH_3}\cdot P_{HCl}}{P^\theta\cdot P^\theta}$，$P_{NH_3}=P_{HCl}=\sqrt{K^\theta\cdot P^{\theta2}}=2.99\times10^{11}\ kPa$

1. $P_{(NH_3)}=\frac{V(NH_3)}{V}P=\frac{2}{198}\times1000=10.1kPa$

$P(N_2)=\frac{V(N_2)}{V}\cdot P=\frac{49}{198}\times1000=247kPa$

$P(H_2)=\frac{V(H_2)}{V}\cdot P=\frac{147}{198}\times1000=742kPa$

D). $K^\theta = \frac{\left(\frac{P(H_2)}{P^\theta}\right)^3 \cdot \left(\frac{P(N_2)}{P^\theta}\right)}{\left(\frac{P(NH_3)}{P^\theta}\right)^2} = 9.81\times10^4$

$\therefore \Delta_r G_m^\theta = -2.03RT\lg K = -64.3\ kJ\cdot mol^{-1}$

10. $K^\theta = \frac{P(CO_2)}{P^\theta} \cdot \frac{P(H_2O)}{P^\theta}$

$P(CO_2) = P(H_2O) = \sqrt{K^\theta \cdot P^\theta} = 5\times10^4\ P^\theta$

12.

$J = \frac{\left(\frac{P(HI)}{P^\theta}\right)^2}{\frac{P(H_2)}{P^\theta}\cdot\frac{P(I_2)}{P^\theta}} = 0.16 < K^\theta$

$J < K^\theta$，正向

$\Delta G_m = RT\ln J - RT\ln K = RT\ln\frac{J}{K} < 0$ ∴正向