

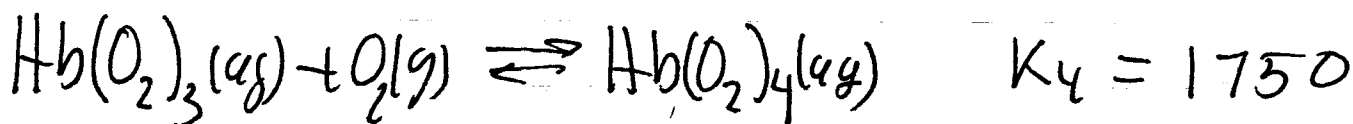
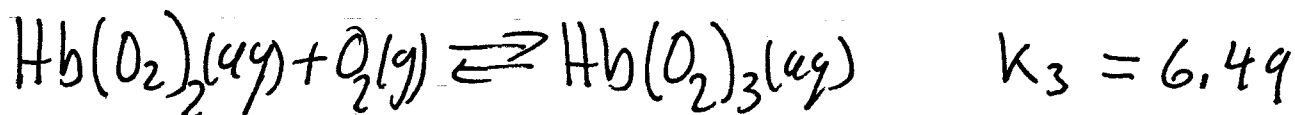
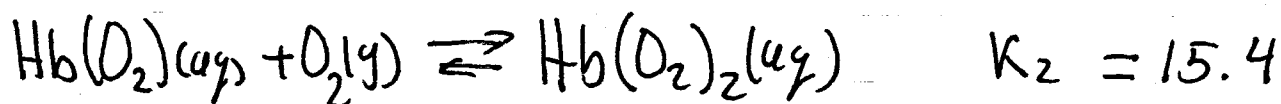
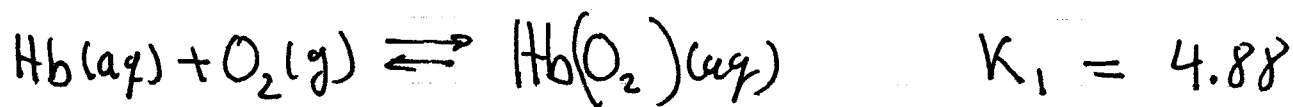
HEMOGLOBIN AND OXYGEN TRANSPORT

0.01 mol $O_2(g)$ PER L OF BLOOD

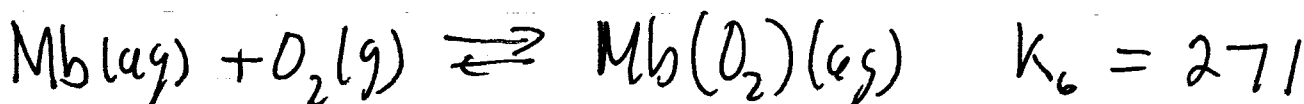
0.0001 mol $O_2(g)$ PER L OF $H_2O(l)$

OXYGEN BINDS TO HEMOGLOBIN (Hb)

Hb CAN BIND UP TO 4 MOLECULES OF $O_2(g)$



MYOGLOBIN



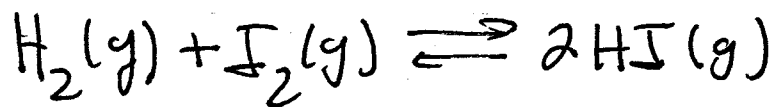
- Calculate K from rxn. data

examples 9.8 and 9.9

- Calculate compositions when K is known

example 9.10

$$T = 400\text{K}$$



$$P_{\text{H}_2} = 1.320\text{ atm}$$

TOO SLOW AT THIS T

$$P_{\text{I}_2} = 1.140\text{ atm}$$

$$\text{CHANGE } T = 600\text{K} \quad K = 92.6$$

NEED PRESSURES AT 600K

$$\frac{P_1}{T_1} = \frac{P_2}{T_2} \Rightarrow$$

$$P_2 = P_1 \frac{T_2}{T_1}$$

AT 600K $p_{H_2}^i = 1.980 \text{ atm}$

$p_{I_2}^i = 1.710 \text{ atm}$

	$H_2(g)$	$I_2(g)$	\rightleftharpoons	$2 HI(g)$
Initial	1.980	1.710		0
Change	-x	-x		+2x
Equilibrium	1.980-x	1.710-x		2x

$$K = 92.6 = \frac{(2x)^2}{(1.980-x)(1.710-x)}$$

$$88.6x^2 - 341.694x + 313.525 = 0$$

$$ax^2 + bx + c = 0$$

$$x_{\pm} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$x = 1.504$ or ~~2.352 atm~~

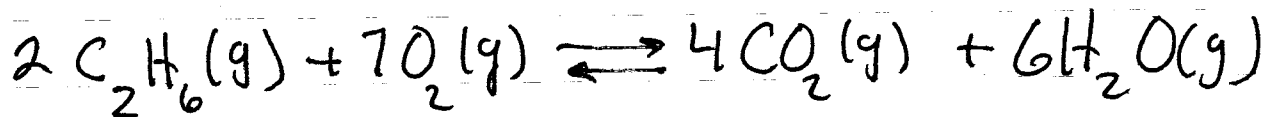
$p_{H_2}^e = 0.48 \text{ atm}$

$p_{HI}^e = 3.00 \text{ atm}$

$p_{I_2}^e = 0.21 \text{ atm}$

% Rec = $\frac{0.21}{1.71} \times 100 = 12\%$

GENERAL CASE



ΔC

$$P_{\text{C}_2\text{H}_6}^i$$

$$-2y$$

$$P_{\text{O}_2}^i$$

$$-7y$$

$$P_{\text{CO}_2}^i$$

$$+4y$$

$$P_{\text{H}_2\text{O}}^i$$

$$+6y$$

ΔE

$$P_{\text{C}_2\text{H}_6}^i - 2y$$

$$P_{\text{O}_2}^i - 7y$$

$$P_{\text{CO}_2}^i + 4y$$

$$P_{\text{H}_2\text{O}}^i + 6y$$

$$K = \frac{[P_{\text{CO}_2}^i + 4y]^4 [P_{\text{H}_2\text{O}}^i + 6y]^6}{[P_{\text{C}_2\text{H}_6}^i - 2y]^2 [P_{\text{O}_2}^i - 7y]^7}$$