⑤ Addition of NO → shift right

2/14/13

Quiz.

$C(s) + 2Cl_2(g) \leftrightarrow CCl_4(g) + \text{energy}$

The reaction will shift R/L when add (s)

The reaction will shift L/R when ↑ temp.

↑ C(s) → ~~right~~ left

↑ temp → left

not shift since solid.

Adding or taking away solids/liquids does not affect equilibrium.

→ Added more ↑ CCl_4 – left

↑ Cl(g) right

↓ Vol – right fewer gas moles.

↓ Pressure, ↑ Vol = shift to side w/ more gas moles. left.

Inert gas – doesn't participate in chemical reaction @ all.

constant volume	constant pressure
container's the same.	↘ overall pressure same.
total P ↑	to keep P constant!
Partial pressure same	Volume must change:
no change.	V↑. Shift to more gas Moles.

4)

	$CH_3COOH(aq)$	+ $H_2O(l)$	⇔ $CH_3COO^-(aq)$	+ $H_3O^+(aq)$
I	0.2M	Some	~~0~~	~~0~~
C	0.2M – x		+x	+x
E	0.2 – ~~x~~		x^2	

5) $\frac{X^2}{0.2M} = 1.8\times10^{-5}$

$\boxed{1.89\times10^{-3}\ M}$

- Assume starting concentration of 0.2M acetic acid. Calculate concentrations of all species at equilibrium.

$K_a = 1.8\times10^{-5}$ (acid)

$H_2O(\ell) + CH_3COOH \rightarrow H_3O(aq) + CH_3COO(aq)$

R			
Initial	0.2M	0	0
C	−x	+x	+x
E	0.2−x	+x	+x

$K = \frac{[H_3O][CH_3COO]}{[CH_3COOH]}$ $\quad K = \frac{(x)(x)}{0.2-(x)}$ – ignore the x because it's small.

$1.8\times10^{-5} = \frac{X^2}{0.2}$

- When can we ignore it?

→ If $K < 1\times10^{-3}$ ignore x in change for starting material.

Q: Assume that concentration of H_3O^+ ↑, what will happen to CH_3COOH?

A: [increase] shift to left.

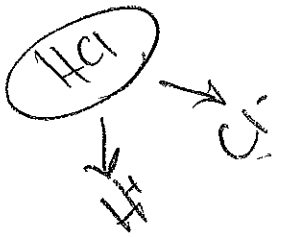
(#2) What happen to CH_3COO^-?

[decrease]

add more H_3O^+

$CH_3COOH + H_2O \rightleftharpoons CH_3COO^- + H_3O^+$ ↑

↑ ?



Part III)

1) $K = \frac{x^2}{0.2M - x} = 1.3 \times 10^6$

$(1.3 \times 10^6)(0.2M - x)$

$2.6 \times 10^5 - 1.3 \times 10^6 x$

4) What is assumed concentration of HCl in a 0.2M aqueous solution of HCl at equilibrium.

→ IONIZE 100%

0.0M

5) What is assumed concentration of hydronium ion in 0.2M aqueous solution of HCl @ equilibrium?

A. 0.2M

100% ionization - start w/ neutral Molecule donates all its H^+

100% dissociation

- Brain dump:

Acid - donor H^+ proton donor, strong acids dissociate 100%, low pH

Base - acceptor H^+,