THINGS TO REMEMBER FOR EXAM #2

Honors Chemistry

#1 WHEN CALCULATING MOLARITY, THE VOLUME NEEDS TO HAVE WHAT UNIT?

Liters (L)

#2 THE MAXIMUM AMOUNT OF SOLUTE DISSOLVED IS CALLED _____.

Saturated solution

#3 LESS THAN THE MAXIMUM AMOUNT OF SOLUTE DISSOLVED IS CALLED _____.

Unsaturated solution

#4 MORE THAN THE MAXIMUM AMOUNT OF SOLUTE DISSOLVED IS CALLED

_____.

Supersaturated solution

#5 THE SOLUBILITY OF SOLIDS GOES _____ AS THE TEMPERATURE IS INCREASED.

Up

#6 THE SOLUBILITY OF GASES GOES _____ AS THE TEMPERATURE IS INCREASED.

Down

#7 IF YOU'RE TRYING TO MAKE A DILUTED SOLUTION, YOU USE THE EQUATION:

$$M_1V_1=M_2V_2$$

#8 WHEN MAKING A DILUTED SOLUTION THE WATER ADDED TO THE NEW SOLUTION IS FOUND BY SUBTRACTING WHICH TWO NUMBERS?

$$\textbf{Water added} = V_2 - V_1$$

#9 FACTORS THAT AFFECT RATE ARE:

1. **Temperature**
2. **Concentration/Pressure**
3. **Surface area**
4. **Catalysts**

#10 FACTORS THAT AFFECT EQUILIBRIUM POSITION:

1. **Temperature**
2. **Concentration/Pressure/Volume**

#11 ONLY _____ CHANGES THE EQUILIBRIUM CONSTANT (K_{EQ})

Temperature

#12 WHAT IS AVERAGE RATE?

Delta over Delta!

- $$Average\ Rate = \frac{\Delta[X]}{\Delta t} = \frac{[X]_{final} - [X]_{initial}}{t_{final} - t_{initial}}$$

#13 WHAT IS A RATE EXPRESSION? WHAT IS IT USED FOR?

Relates rate of a reactant or product to another reactant or product

$$N_2 + 3\,H_2 \rightarrow 2\,NH_3$$

$$\frac{-\Delta[N_2]}{\Delta t} = \frac{-\Delta[H_2]}{3\,\Delta t} = \frac{\Delta[NH_3]}{2\,\Delta t}$$

Entire thing is the RATE EXPRESSION

REMEMBER!

Reactants are negative, Products are positive.

#14 WHEN YOU WANT THE RATE OF ONE SUBSTANCE BUT YOU ONLY HAVE THE RATE FOR ANOTHER SUBSTANCE, YOU CAN USE THE _____ TO SOLVE FOR THE MISSING RATE.

PRACTICE Q: SOLVE RATE OF H_2 IN TERMS OF N_2

$$N_2 + 3\ H_2 \rightarrow 2\ NH_3$$

$$\frac{-\Delta[N_2]}{\Delta t} = \frac{-\Delta[H_2]}{3\ \Delta t} = \frac{\Delta[NH_3]}{2\ \Delta t}$$

Rate Expression

$$\frac{3\ \Delta[N_2]}{\Delta t} = \frac{\Delta[H_2]}{\Delta t}$$

#15 THE RATE LAW ONLY INCLUDES THE CONCENTRATIONS OF THE _____.

Reactants!

#16 THE EQUILIBRIUM EXPRESSION IS _____ DIVIDED BY _____

[Products]

[Reactants]

#17 THE RATE LAW EXPONENTS ARE CALLED _____. ARE THEY FROM THE BALANCED EQUATION COEFFICIENTS OR FOUND EXPERIMENTALLY?

Orders

FOUND EXPERIMENTALLY!

If they reaction is a single step reaction, then yes they will match…but you have to be told that! Never assume the exponents will be the coefficients!

#18 ARE THE EXPONENTS IN AN EQUILIBRIUM EXPRESSION FROM THE BALANCED EQUATION COEFFICIENTS OR FOUND EXPERIMENTALLY?

Balanced equation coefficients

#19 SOLIDS AND LIQUIDS DO OR DO NOT AFFECT EQUILIBRIUM?

DO NOT!

#20 A LARGE VALUE FOR K INDICATES THAT THE _____ SIDE IS FAVORED AND A SMALL VALUE FOR K INDICATES THE _____ SIDE IS FAVORED.

Products (right) – "equilibrium lies to the right"

Reactants (left) – "equilibrium lies to the left"

#21 $K'_{eq} = ????$

$$\frac{1}{K_{eq}}$$

#22 IF Q IS BIGGER THAN K, THAN THE REACTION WILL SHIFT TO THE _____.

Left (towards the reactants)

Numerator is too big! You have too many products!

#23 IF Q IS SMALLER THAN K, THAN THE REACTION WILL SHIFT TO THE _____.

Right (towards the products). Denominator is too big! You have too many reactants!

#24 I CAN USE THE 5% RULE WHEN:

1. **K < 1**
2. **If K is 1000x smaller than the initial concentration**
3. **X is 5% or less of the initial concentrations**
4. $\frac{x}{[initial]} x\ 100 \leq 5\%$ ***use x NOT K***

#25 ALSO…

1. CAREFUL WITH SCIENTIFIC NOTATION!
2. CAREFUL WITH METRIC CONVERSIONS!
3. PUNCH YOUR CALCULATOR CORRECTLY!
4. USE PARENTHESES!
5. ANSWER THE QUESTION THAT IS ACTUALLY ASKED!!!
6. SHOW ENOUGH WORK TO PROVE YOU DID THE PROBLEM…BUT DON'T WASTE ALL YOUR TIME DOING SO!
7. STUCK? MOVE ON AND COME BACK LATER! CAREFUL ON YOUR BUBBLE SHEET!!!!!
8. TAKE A BREATH AND JUST ANSWER ONE QUESTION AT A TIME ☺