

PENANG SANGAM HIGH SCHOOL

P.O.BOX 44, RAKIRAKI

LESSON NOTES

WEEK 19

Year/Level: 13A/B

Subject: Chemistry

Strand 3	Reactions
Sub Strand 3.3	Aqueous Chemistry
Content Learning Outcome	By the end of this lesson students should be able: <ul style="list-style-type: none">• Write equilibrium constant expressions (K_c) for systems at equilibrium• Use K_c expression to calculate the value of K_c value of a reaction

Reactions

1. Reversible Reactions

Reactions in which the products can be reconverted back into reactants.

Indicated by two half arrow heads (\rightleftharpoons) between the reactants and the products.

2. Irreversible Reactions

Reactions in which the products cannot be converted back into the reactants.

Chemical Equilibrium/Dynamic Equilibrium

Stage at which both the **forward and the backward reaction** occurs at the same rate.

The reactants and the products are consumed and produced at the same rate.

Types of Chemical Equilibrium

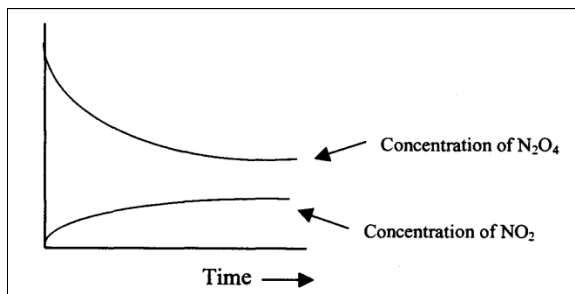
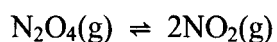
1. **Homogenous Equilibrium**

Has everything present in the same phase. For example, reactions where everything is either in gas phase or solution form.

2. **Heterogeneous Equilibrium**

Have substances present in more than one phase. For example, reactions involving solids and gases or solids and liquids.

Example:



In the initial state, only N_2O_4 is present in the vessel and there is no NO_2 .

Hence, initially the rate of the forward reaction will be the fastest.

As time passes, concentration of N_2O_4 will decrease while that of NO_2 will increase.

(who can think of a reason to this? ... YES! it's all the factors that you apply (increase/decrease in concentration of reactants and products, increase in pressure favors side with less number of moles and vice versa, increase in temperature favors endothermic rxn and vice versa, and surface area!)

The rate of forward reaction will keep on decreasing while that of reverse reaction will increase.

A time will come when both the rates will become equal and at this stage, reactants and products will be consumed and produced at the same rate.

It will appear as if the reaction has come to a standstill although both forward and backward reactions are occurring at the same rate.

1. Which is the correct symbol to show a reversible reaction?
 - a) =
 - b) –
 - c)
 - d)

2. What happens if you remove some of one of the products from a system at dynamic equilibrium?
 - a) Less products are made
 - b) More products are made
 - c) More reactants are made

3. If the forward reaction is endothermic, what will be the effect of decreasing the temperature?
 - a) Increase the yield of the products
 - b) Decrease the yield of the products
 - c) Increase the reaction rate

Thank you for successful completion of this lesson

“The struggle you’re in today is developing the strength you need for tomorrow”