

# Homework

## Chemistry

Q1:

Differentiate between reversible and irreversible reactions.

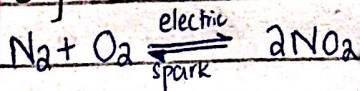
Ans:

### Reversible Reactions

- The reactions which proceed in both forward and reverse directions are called reversible reactions.

- These reactions are unstable.

E.g.



### Irreversible reactions.

- The reactions which only proceed in forward directions are called irreversible reactions.

- These reactions are stable.

E.g.



Q2:-

Differentiate btw forward and reverse reactions

Ans:

### Forward Reaction

It is a reaction in which reactants react to form products.

It proceeds from left to right

E.g.

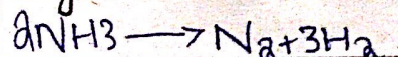


### Reverse Reaction

It is a reaction in which products react to form reactants.

It proceeds from right to left

E.g.





# HOMWORK

Chemistry:

## SELF ASSESSMENT 9.1

(i)



Forward Reaction:



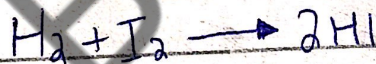
Reverse Reaction:



(ii)



Forward Reaction:



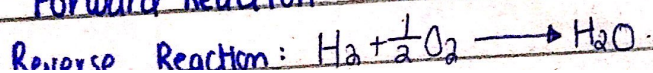
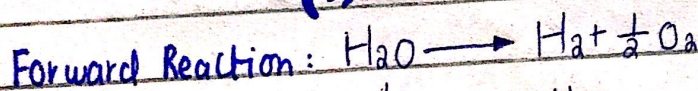
Reverse Reaction



Q.5:-

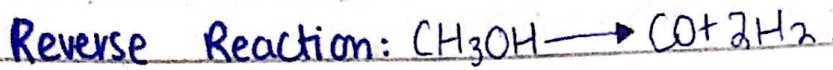
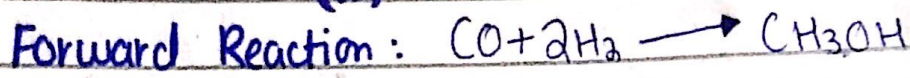
Write the forward and reverse reactions.

(i)

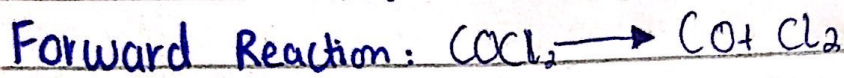




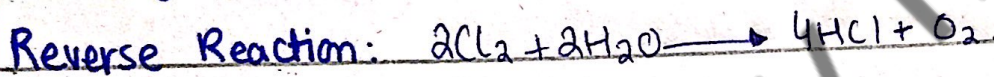
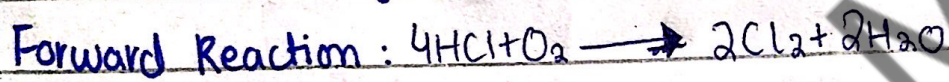
(ii)



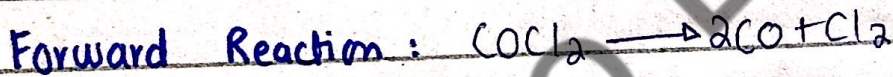
(iii)



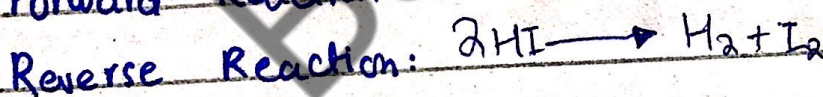
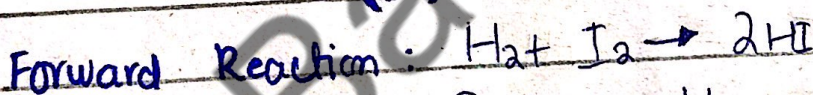
(iv)



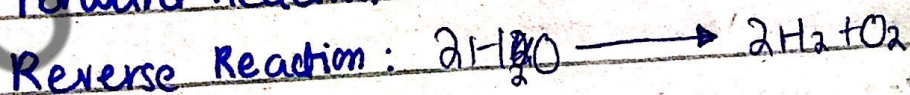
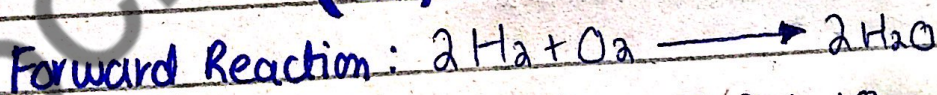
(v)



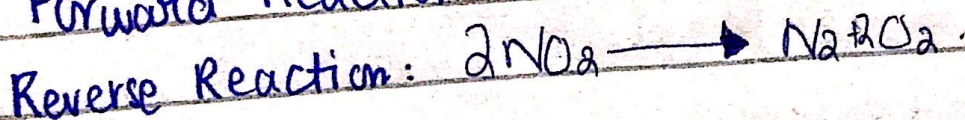
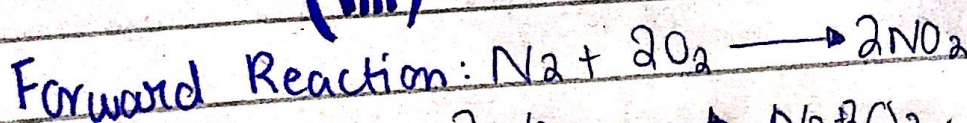
(vi)



(vii)



(viii)





HOMEWORK

# SELF ASSESSMENT 9.2

Q1:- Following reaction can occur during lightning storms.



Forward reaction:  $3O_2 \rightarrow 2O_3$

Reverse reaction:  $2O_3 \rightarrow 3O_2$

$$K_c = \frac{[O_3]^2}{[O_2]^3}$$

Q2: Write equilibrium constant expression for the following reactions.

(i)

$$K_c = \frac{[H_2O]^2 [Cl]_2}{[HCl]^4 [O_2]}$$

(ii)

$$K_c = \frac{[CH_3COOC_2H_5][H_2O]}{[CH_3COOH][C_2H_5OH]}$$

(iii)

$$K_c = \frac{[H_2][F_2]}{[HF]^2}$$



(iv)

$$K_c = \frac{[N_2O_4]}{[NO_2]^2}$$



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# SELF ASSESSMENT 9.3

Determine the units of equilibrium constants for the following reactions.

(i)

$$K_c = \frac{[NO]^2}{[N_2][O_2]}$$
$$= \frac{[\text{mol} \cdot \text{dm}^{-3}]^2}{[\text{mol} \cdot \text{dm}^{-3}][\text{mol} \cdot \text{dm}^{-3}]}$$

$K_c = \text{no units.}$

(ii)

$$K_c = \frac{[H_2O][CO]}{[H_2][CO_2]}$$
$$= \frac{[\text{mol} \cdot \text{dm}^{-3}][\text{mol} \cdot \text{dm}^{-3}]}{[\text{mol} \cdot \text{dm}^{-3}][\text{mol} \cdot \text{dm}^{-3}]}$$

$K_c = \text{no units.}$

(iii)

$$K_c = \frac{[PCl_3][Cl_2]}{[PCl_5]}$$
$$= \frac{[\text{mol} \cdot \text{dm}^{-3}][\text{mol} \cdot \text{dm}^{-3}]}{[\text{mol} \cdot \text{dm}^{-3}]}$$

$K_c = \text{mol} \cdot \text{dm}^{-3}.$



(iv)

$$K_c = \frac{[\text{CH}_3\text{OH}]}{[\text{CO}][\text{H}_2]^2}$$

$$K_c = \frac{[\text{mol}\cdot\text{dm}^{-3}]}{[\text{mol}\cdot\text{dm}^{-3}][\text{mol}\cdot\text{dm}^{-3}]^2}$$

$$K_c = \frac{1}{[\text{mol}\cdot\text{dm}^{-3}]^2}$$

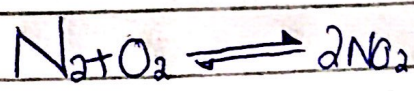


# HOMWORK.

## Chemistry.

### Practice Problem 9.4:-

An equilibrium mixture of  $N_2$ ,  $O_2$  and  $NO$  gases at 1500K is determined to consist of  $6.4 \times 10^{-3} \text{ mol/dm}^3$  of  $N_2$ ,  $1.7 \times 10^{-3} \text{ mol/dm}^3$  of  $O_2$  and  $1.1 \times 10^{-5} \text{ mol/dm}^3$  of  $NO$ . What is the equilibrium constant for the system at this temperature.



### Given data:

- $N_2 = 6.4 \times 10^{-3} \text{ mol/dm}^3$
- $O_2 = 1.7 \times 10^{-3} \text{ mol/dm}^3$
- $NO = 1.1 \times 10^{-5} \text{ mol/dm}^3$

### Required:

$$K_c = ?$$

### Solution:

$$K_c = \frac{[NO]^2}{[N_2][O_2]}$$

$$K_c = \frac{[1.1 \times 10^{-5}]^2}{[6.4 \times 10^{-3}][1.7 \times 10^{-3}]}$$

$$K_c = \frac{[1.21 \times 10^{-10}]}{[1.088 \times 10^{-5}]}$$

$$K_c = 1.12 \times 10^{-5}$$