Dr. Dasarath Mal

SEM -1

ACIDS & BASES

Name- Mrinmoy Samaddar
Roll No- 20211213
1st (sem) chemistry (H)

① Reaction between CaO and P_4O_{10} in molten state is an acid base reaction.

Ans:- According to Lux-Flood, acids are always oxide ion acceptor and bases are oxide ion donor. The acids and bases are related as oxide ion transfer.

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
$$2P_2O_5 + 6O^{2-} \rightleftharpoons 4PO_4^{3-}$$
$$\overline{6CaO + 2P_2O_5 = 2Ca_2(PO_4)_2}$$

In the above reaction, CaO donates O^{2-} i.e. it acts as a base P_4O_{10} i.e. $2P_2O_5$ accepts O^{2-} i.e it acts as a acid. Thus, the above reaction is nothing but an acid-base reaction According to Lux-Flood concept of acid base.

② Acetic Acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 and $(CH_3)_2NH$ -- explain

Ans:- If the reference base i.e. solvent is a very good proton acceptor then for different acids, the extent of proton transfer may occur about- 100%. that is, the acids are completely dissociated. If it occurs so, then all such acids appear to be equaily strong. such Solvents i.e. reference base are referred to as leveling solvents with respect to acid.

To differentiate the acid strengths of acids, a weak proton acceptor (week acid) is to be taken as the reference solvent and to level the acids strengths a good proton acceptor is to be taken as a reference solvent i.e. acidic solvents will Level of the bases (differentiate the acids) while the basic solvents will differentiate the bases (Level of the acids).

Since, all NH_3, CH_3NH_2 and $(CH_3)_2NH$ are bases. Thus, in acetic acid 100% proton transfer from acetic acid to these bases occur and all acids are seen equivalent in strength i.e. all are Level of, Thus, Acetic acid cannot be used as the solvent to determine the relative strengths of bases. NH_3 CH_3NH_2 and $(CH_3)_2NH$.

3. Indentify the acid and base in the following reaction. Give reason.

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$$

Ans:- According to usanovich concept of acid-base,

An acid is any chemical species which

iv. which react with base

v. Accepts anion or electron

vi. Furnish cations.

A base is any chemical species which

iv. which react with acid

v. Furnish anion or electron

vi. Accepts cation

In the above reaction, SbF_5 accepts anion F^- i.e. SbF_5 acts as an acid. Again, XeF_6 donates anion F^- i.e. XeF_6 acts as a base in the above given reaction. Here acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+ [SbF_6]^-$

Name - Amit Paul
Semester- 1st
College – Vidyagarh Jyotish Roy College.
Roll- 20211374

Q.1) Reaction between CaO and P_4O_{10} in molten state in an acid-base reaction.

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In the above reaction, CaO donates O^{2-} i.e. It acts as a base. P_4O_{10} i.e. $2P_2O_5$ accepts O^{2-} i.e. It acts as a acid. Thus the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid-base.

Q.2) Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2, and $(CH_3)_2NH$ --- explain.

Ans- If the reference base i.e. solvent is a very good proton acceptor then for different acids, the extent of proton transfer may occur about ~100%. That is, the are completely dissociated. If it occurs so, then all such acids appears to be equally strong. Such solvents i.e reference base are referred, to as leveling solvents with respect to an acid.

To differentiate the acid strengths of acids a weak proton acceptor (weak acid) is to be taken as the reference solvent i.e acidic solvent and to level the acids strengths a good proton acceptor is to be taken as a reference solvent i.e acidic solvent will level off the bases (differentiate the acids) while the basic solvents will differentiate the bases (levell off the acids).

Since, all NH_3, CH_3NH_2 and $(CH_3)_2NH$ are bases. Thus in acetic acid 100% proton transfer from acetic acid to these bases occur and all acids are seen equivalent in strengthth i.e. all are level off. Thus, Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 and $(CH_3)_2NH$.

Q.3) Identify the acid-base in the following reaction. Give reason.

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$$

Ans- According to Lux-Flood concept of acid-

– An acid is any chemical species which

(iv) which react with base
(v) Accepts anion or electron
vi) Furnish cations,

A base is any chemical species which -

(iv) which react with acid
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(vi) Accpts captions.

In the above reaction SbF_5 accepts anion F^- i.e, SbF_5 acts as an acid, Again, XeF_6 donates anion F^- i.e XeF_6 acts as a base in the above given reaction. Here acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+[SbF_6]^-$

Name - Anushka Ghosh Roll - 20211244

Semester - 1st

College - Vijaygarh Jyotish Ray College

Q15) Reaction between CaO and P_4O_{20} in molten state is an acid - base reaction.

Ans: According to Lux - Flood, acids are always oxide ion acceptor and bases are oxide - ion donor. The acids and bases are related as oxide ion transfer,

$$6\,CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$

$$6O_2 + 2P_2O_5 \rightleftharpoons 4PO_4^{3-}$$

$$6\,CaO + 2P_2O_5 \rightleftharpoons 2Ca_3(PO_4)_2$$

In the above reaction, CaO donates O^{2-} ie it acts as a base. P_4O_{20} ie $2P_2O_5$ accepts O^{2-} ie it acts as acid. Thus, the above reaction is nothing but an acid - base reaction according to Lux - Flood concept of acid - base.

Q16) Acetic acid cannot be used as the solvent to determine the relative strength of bases — NH_3, CH_3NH_2 and $(CH_3)_2NH$. Explain.

Ans: If the reference base ie solvent is a very good proton acceptor than for different acids, the extent of proton transfer may occur about 100%. That is, the acids are completely dissociated. If it occurs so, than all such acids appear to be equally strong. Such solvents ie reference base are referred to as levelling solvents with respect to the acid.

To differentiate, the acid strengths of acids, a weak proton (weak acid) is to be taken as a reference solvent and to level the acid strengths, a good proton acceptor (differentiate the acids) while the base solvents will differentiate the bases (level off the acids)

Since, all NH_3, CH_3NH_2 and $(CH_3)_2NH$ are bases. Thus, in acetic acid 100% proton transfer from acetic acid to these bases occur and all acids are seen equivalent in strength ie all are level off. Thus, acetic acid cannot be used as the solvent to determine the relative strength of bases NH_3, CH_3NH and $(CH_3)_2NH$.

Q17) Identify the acids and bases in the following reaction. Give reason : $XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$

Ans: According to Usanovich concept of acid - base,

An acid is any chemical species which —

(iv) react with base
(v) accepts anion or electron
(vi) furnish cations.

A base is any chemical species which —

(iv) reacts with acid
(v) furnish anion or electron
(vi) accepts cations

In the above reaction, SbF_5 accepts anion F^- ie SbF_5 acts as an acid. Again, XeF_6 donates anion F^- ie XeF_6 acts as a base in the above given reaction. Here, acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+ [SbF_6]^-$

Name - Anushka Ghosh Roll - 20211244

Semester - 1st

College - Vijaygarh Jyotish Ray College

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$$6\,CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$

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In the above reaction, CaO donates O^{2-} ie it acts as a base. P_4O_{20} ie $2P_2O_5$ accepts O^{2-} ie it acts as acid. Thus, the above reaction is nothing but an acid - base reaction according to Lux - Flood concept of acid - base.

Q16) Acetic acid cannot be used as the solvent to determine the relative strength of bases — NH_3, CH_3NH_2 and $(CH_3)_2NH$. Explain.

Ans: If the reference base ie solvent is a very good proton acceptor than for different acids, the extent of proton transfer may occur about 100%. That is, the acids are completely dissociated. If it occurs so, than all such acids appear to be equally strong. Such solvents ie reference base are referred to as levelling solvents with respect to the acid.

To differentiate, the acid strengths of acids, a weak proton (weak acid) is to be taken as a reference solvent and to level the acid strengths, a good proton acceptor (differentiate the acids) while the base solvents will differentiate the bases (level off the acids)

Since, all NH_3, CH_3NH_2 and $(CH_3)_2NH$ are bases. Thus, in acetic acid 100% proton transfer from acetic acid to these bases occur and all acids are seen equivalent in strength ie all are level off. Thus, acetic acid cannot be used as the solvent to determine the relative strength of bases NH_3, CH_3NH and $(CH_3)_2NH$.

Q17) Identify the acids and bases in the following reaction. Give reason : $XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$

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A base is any chemical species which —

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(vi) accepts cations

In the above reaction, SbF_5 accepts anion F^- ie SbF_5 acts as an acid. Again, XeF_6 donates anion F^- ie XeF_6 acts as a base in the above given reaction. Here, acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+ [SbF_6]^-$

Name-Sudipto Bose, Sem-1st, Roll-20210292, College: Vijaygarh Jyotish Roy College.

Q. Reaction between CaO and P_4O_{10} in molten state is an acid-base reaction.

Ans: According to Lux-Flood acids are always oxide ion acceptors and bases are oxide ion donor. The acids and bases are related as oxide ion transfers.

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
$$2P_2O_5 + 6O^{2-} \rightleftharpoons 4PO_4^{3-}$$
$$\overline{6CaO + 2P_2O_5 = 2Ca_3(PO_4)_2}$$

In the above reaction, CaO donates O^{2-} i.e, if acts as a base. P_4O_{10} i.e, $2P_2O_5$ accepts O^{2-} i.e if acts as a acid. Thus the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid-base.

Q. Acetic acid cannot be used as the solvent to determine the relative strength of bases NH_3, CH_3NH_2 and $(CH_3)_2NH$ --- explain.

Ans: If the reference base i.e solvent is a very good proton acceptor then for different acids, the extent of proton transfer may occurs about - 100%. That is the acids are completely dissociated. If it occurs so, then all such acids appears to be equally strong. Such solvents i.e, referentiate base are reffered to as levelling solvents with respect to the acid.

To differentiate the acid strength of acids, a weak proton acceptor (weak acid) is to be taken as the reference solvent and to level the acids strengths, a good proton acceptor (is to be taken as a reference solvent i.e acidic solvents will level off the bases (differentiate the acids) while the basic solvents will differentiate the bases (ie level off the acids).

Since all NH_3, CH_3NH_2 and $(CH_3)NH$ are bases. Thus, in acetic acid 100% proton transfer from acetic acid to these bases and all acids are sum equivalent in strength i.e, all are level off. Thus Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 and $(CH_3)_2NH$.

Q. Identify the acid and base in the following reaction. Give reason

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$$

Ans: According to Usanovich concept of acid-base,

An acid is any chemical species which—
i) react with base
ii) accepts anion or electron.
iii) furnish cations

A base is any chemical species which—
i) react with acid
ii) furnish anion or electron
iii) accepts cations

In the above reaction, SbF_5 accepts anion F^- i.e. SbF_5 acts as an acid Again, XeF_6 donates anion F^- i.e. XeF_6 acts as a base in the above given reaction. Here acid SbF_5 reacts with base XeF_6 and form salt. $[XeF_5]^+ [SbF_6]^-$.

VISHAL SINGH ; SEM-I ROLL NO. - 2021077

Q1. Reaction b/w CaO and P_4O_{10} in molten state in an acid-base rxn. Explain by a theory of your choice

- According to Lux-flood theory, acids are always oxide ion acceptor and bases are oxide ion donor. the acids and bases are related as oxide ion transfer

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
$$2P_2O_5 + 6O^{2-} \rightleftharpoons 4PO_4^{3-}$$
$$6CaO + 2P_2O_5 = 2Ca_2(PO_4)_2$$

In the above rxn, CaO donates O^{2-} i.e. it acts as a base and P_4O_{10} i.e. P_2O_5 accepts O^{2-} and acts as an acid. Thus, this reaction is nothing but an acid-base reaction according to Lux-flood concept of acid-base

Q2. Acetic Acid can't be used as the solvent to determine the relative strength of bases NH_3 CH_3NH_2 & $(CH_3)_2NH$. Explain.

- If the reference base i.e. solvent is a very good proton acceptor then for different acids, the extent of proton transfer may occur about 100%. i.e. the acids are completely dissociated. If it occurs so then all such acids appear to be equally strong, such solvents (reference base) are referred to as leveling solvents w.r.t. an acid.

To differentiate the acidic strengths of an acid, a weak proton acceptor is to be taken as the reference solvent and to level the acid strengths, a good proton acceptor is to be taken as the reference solvent, i.e. acidic solvents will level off the bases (differentiate the acids) while basic solvents will differentiate the bases (level off the acid).

Since, all NH_3 CH_3NH_2 and $(CH_3)_2NH$ are bases, thus, in acetic acid 100% proton transfer from acetic acid to these bases occur and all acids are seen equivalent in strength i.e. all are level off. Thus, acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 & $(CH_3)_2NH$

Q3. Identify the acid and base in the following reaction, Give reason

$$XeF_6 + SbF_5 \longrightarrow [XeF_5] + [SbF_6]^-$$

According to usanovich theory of acid-base

An acid is any chemical species which – (i) react with base
(ii) accepts anion or electron
(iii) donates cations

A base is any chemical species which – (i) react with acid
(ii) donates anion or electron
(iii) accepts cations

In the above reaction, SbF_5 accepts anion F^-, i.e. SbF_5 acts as an acid. Again XeF_6 donates anion F^-, i.e. XeF_5 acts as a base. Hence acid SbF_5 reacts with base XeF_6 and forms salt $[XeF_5]^+[SbF_6]^-$

Name = Abhayshankar Jha
Roll no = 20211181
1st semester

1) Reaction between CaO P_4O_{10} in molten state in an acid-base reaction .... Explain a theory.

=> According to Lux Flood acid are always oxid ion acceptors and base are related as oxide ion donor. The acid and base are related as oxide ion transfer.

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
$$2P_2O_5 + 6O^-_2 \rightleftharpoons 4PO_4^{3-}$$
$$\overline{6CaO + 2P_2O_5 = 2Ca_2(PO_4)_2}$$

In the above reaction CaO donates O^{2-} ie. it acts as a base i.e, $2P_2O_5$ accepts 6^{2-}, ie, its acts as a acid. Thus the above reaction is nathing but an acid-base reaction according to Lux-flood concept of acid base.

2) Acidic acid cannot be used as the solvent to determine the relative strength of base NH_2CH_3 and $(CH_3)_2NH$ .... explain.

=> If the reference base i.e. salvent is very good proton acceptor than for diffrent acids, the extent of poton transfer may occur about 100%. That is acids are completely dissociated. If it occurs so, then all such acids are completely dissociated. If it occurs so then all such acid appears to be equally strong such salvents i.e. reference base are recarded referred to as travelling salvents with respect to the acid.

To diffrentiate the acid strong strengths of acids, a weak proton acceptor is to be taken the surface salvent and to level acid strengths; a good proton acaptor is to be taken as refference salvent.ie

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Since, all NH_3, CH_3NH_2 and $(CH_3)NH$ are bases. Thus in acetic acid 100% proton transfer from acetic to these bases occur and all acids are seen ~~equi~~ equivalent in strength i.e. all are level off. Thus Acetic acid cannot be used as the solvent to determine relative strengths of base in $NH_3CH_3NH_2$ and $(CH_3)_2NH$.

3) Identify the acid and base in the following reaction. Give reason.

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$$

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An acid is any chemical species which
1. which react with base.
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3. Furnish Cations..

A base is any chemical species which
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In the above reaction SbF_5 accepts anion F^- i.e SbF_5 acts as an acid, again XeF_6 acts as a base in the above given reaction. Here acid SbF_5 reacts with base XeF_6 and form Salt $[XeF_5]^+ [SbF_6]^-$.

Name - Sanchita Saha.
Semester - I
College - Vijaygarh Jyotish Ray College.

1. Reaction between CaO and P_4O_{10} in malten state in a acid-base reaction... Explain by a theory of your choice.

Ans) According to Lux-Flood, acids are always oxide ion acceptor and bases are oxide ion doner. The acids and bases are related as oxide ion transfer.

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
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In the above reaction CaO donates O^{2-} ie, it acts as a base i.e, $2P_2O_5$ accepts O^{2-} ie, its acts as a acid. Thus the above reaction is nothing but an acid-base reaction according to lux-flood concept of acid-base.

2. Acidic acid can not be used as the salvent to determine the relative Strengths of bases NH_3 CH_3NH_2 and $(CH_3)_2NH$ ..... explain.

Ans) If the reference base i.e. Salvent is a very good proton acceptor than for different acids, the extent of proton transfer may occur about - 100%. That is acids are Complitely dissociated. If it occures so, then all such acids appears to be equally strong. Such salvents i.e. reference base are referred to as leveling Salvents with respect to the acid.

To differentiate the acid strengths of acids, a weak proton acceptor is to be taken the reference salvent and to level the acid strengths; a good proton acceptor is to be taken as reference Salvent. i.e. acidic salvents will level of the bases (differentiate the acid) while the basic salvents will differentiate the bases (level off the acids).

Since, all NH_3 CH_3NH_2 and $(CH_3)NH$ are bases. Thus in acetic acid 100% proton transfer from acetic to these bases occur and all acids are seen equivalent in strength i.e. all are level off. Thus Acetic acid can not be used as the Solvent to determine relative strengths of base in NH_3 CH_3NH_2 and $(CH_3)_2NH$.

3. Identify the acid and base in the following reaction. Give reason.

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+[SbF_6]^-$$

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Name – Iit chakraborty.
collage – Vidyagarh Jyotish Roy collage 1st Sem
Roll – 20211510

15. Reaction between cao and P_4O_{10} in molten state is an acid-base reaction .... Explain by a theory of your choice.

According to Lux-Flood, acids are always oxide ion acceptor and bases are oxide ion donor. The acids and bases are related as oxide ion transfer.

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
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$$6CaO + 2P_2O_5 = 2Ca_3(PO_4)_2$$

In the above reaction, CaO donates O^{2-} i.e. it acts as a base. P_4O_{10} i.e. $2P_2O_5$ accepts O^{2-} i.e. it acts as a acid. Thus, the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid-base.

16. Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2, & $(CH_3)_2NH$ ..... explain.

If the reference base i.e. Solvent is a very good proton acceptor than for different acids, the extent of proton transfer may occur about 100%. That is, the acids are completely dissociated. If it occurs so, then all such acids appear to be equally strong. Such solvents i.e. reference base are refferred to as leveling solvents with respect to the acid.

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17. Identify the acid and base in the following reaction. Give reason.

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$$

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In the above reaction, SbF_5 accepts anion F^- i.e. SbF_5 acts as an acid. Again, XeF_6 donates anion F^- i.e. XeF_6 acts as a base in the above given reaction. Here acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+[SbF_6]^-$.

NAME: Soumaditya Roy
SEMESTER: 1st
COLLEGE: Vijaygarh Jyotish Ray College

1. Reaction between CaO and P_4O_{10} in molten state is acid base reaction. . . . Explain by a theory of your choice

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In the above reaction CaO donates O^{2-} i,e it acts as a base P_4O_{10} i,e $2P_2O_5$ accepts O^{2-} i,e acts as a acid. Thus, the above reaction is nothing but an acid-base reaction according to lux-flood Concept of acid-base

2. Acetic acid cannot be used as the Solvent to determine the relative Strengths of base NH_3, CH_3NH_2 & $(CH_3)_2NH$ - - - Explain...

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3. Identify the acid and base in the following reaction. Give reason.

$$XeF_6 + SbF_5 \rightarrow [XeF_5]^+ [SbF_6]^-$$

Ans) According to Usanovich concept of acid-base;
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Name - Zeba Anwar
Semester - 1st
College - Vijoygarh Jyotish Ray College.

Q1] Reaction between CaO and P_4O_{10} in molten state is an acid-base-reaction.

Ans. According to Lux-Flood, acids are always oxide ion acceptor and bases are oxide ion donor. The acids and bases are related as oxide ion transfer,

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In the above reaction, CaO donates O^{2-} i.e., it acts as a base. P_4O_{10} i.e., $2P_2O_5$ accepts O^{2-} i.e., it acts as a acid. Thus, the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid-base.

Q2] Acetic acid cannot be used as the solvent to determine the relative strength of bases; - NH_3, CH_3NH_2 and $(CH_3)_2NH$ ... Explain.

Ans. If the reference base i.e., solvent is a very good proton acceptor than for different acids, the extent of proton transfer may occur about - 100%. That is, the acids are completely dissociated. If it occurs so, then all such acids appear to be equally strong. Such solvents i.e., reference base are referred to as levelling solvents with respect to the acid.

To differentiate the acid strengths of acids, a weak proton (weak acid) is to be taken as a reference solvent and to level the acids strengths, a good proton acceptor (differentiate the acids) while the basic solvents will differentiate the bases (level off the acids).

Since, all NH_3, CH_3NH_2 and $(CH_3)_2NH$ are bases. Thus, in acetic acid 100% proton transfer from acetic acid to the

bases occur and all acids are seen equivalent in strength ie, all are level off. Thus, acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 and $(CH_3)_2NH$.

Q3| Identify the acids and bases in the following reactions. Give reason - $XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$

Ans| According to Usanovich concept of acid-base,

An acid is any chemical species which -

(iv) which react with base.

(v) accepts anion or electron

(vi) furnish cations.

A base is any chemical species which -

(iv) which reacts with acid.

(v) furnish anion or electron

(vi) accepts cations.

In the above reaction, SbF_5 accepts anion F^- i.e; SbF_5 acts as an acid. Again, XeF_6 donates anion F^- ie., XeF_6 acts as a base in the above given reaction. Here, acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+ [SbF_6]^-$

Manas Adhikari ; Sem-1 ; Roll No. - 20211156

Q. Reaction between CaO and P_4O_{10} in molten state is an acid base reaction.

→ According to Lux Hood, acids are always oxide ion acceptor and bases are oxide ion donor. The acids and bases are related as oxide ion transfer.

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
$$2P_2O_5 + 6O^{2-} \rightleftharpoons 4PO_4^{3-}$$
$$\overline{6CaO + 2P_2O_5 = 2Ca_3(PO_4)_2}$$

In the above reaction, CaO donates O^{2-} i.e. if acts as a base. P_4O_{10} i.e. $2P_2O_5$ accepts O^{2-} i.e. if acts as a acid. Thus the above reaction is nothing but an acid-base reaction according to Lux-Hood concept of acid-base.

Q. Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 and $(CH_3)_2NH$ - explain.

→ If the reffrence base i.e. solvent is very good proton acceptor than different acids, the extent of proton transfer may occurs about 100%. The acids are completely dissociated.

To differentiate the acid strength of acids, a weak proton acceptor (weak acid) is to be taken as the reffrence solvent and to level the acids strengths a good proton acceptor is to be taken as a reffrence solvent i.e. acidic solvents will level of the bases.

Since, all NH_3, CH_3NH_2 and $(CH_3)_2NH$ are bases. Thus, in acitic acid 100% proton transfer from acetic acid to this bases occur and all acids are seen equivalent in strength i.e. all are level off. Thus, Acetic acid cannot be used as the solvent to determine the relative strength of bases NH_3, CH_3NH_2, $(CH_3)_2NH$.

Q. Identify the acid and base in the following reaction. Give reason.

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$$

→ According to Usanovich concept of acid-base,

An acid is any chemical species which -

(i) reacts with base, (ii) accepts e^-, (iii) furnish cation

A base is any chemical species which -

(i) react with acid, (ii) furnish e^-, (iii) Accepts cation

In above reaction, SbF_5 accepts anion F^- i.e. SbF_5 acts as an acid. Again, XeF_6 donates anion F^- i.e. XeF_6 acts as a base, in the above given rxn. Here acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+ [SbF_6]^-$.

Megha Guchait ; Sem-I ; Roll-20210852

Q. Reaction between CaO and P_4O_{10} in molten state is an acid-base reaction.

A. According to Lux-Flood, acids are always oxide ion acceptor and bases are oxide ion donor. The acids and bases are related as oxide ion transfer.

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
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In the above reaction, CaO donates O^{2-} i.e. it acts as a base. P_4O_{10} i.e. $2P_2O_5$ accepts O^{2-} i.e. it acts as a acid. Thus, the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid-base.

Q. Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 and $(CH_3)_2NH$ .... explain.

A. If the reference base i.e. solvent is a very good proton acceptor than for different acids, the extent of proton transfer may occurs about -100%. That is, the acids are completely dissociated. If it occurs so, then all such acids appear to be equally strong. Such solvents i.e. referentiate base are reffered to as leveling solvents with respect to the acid.

To differentiate the acid strengths of acids, a weak proton acceptor (weak acid) is to be taken as the refference solvent and to level the acids strengths, a good proton acceptor (is to be taken as a reference solvent. i.e acidic solvents will level off the bases (differentiate the acids) while the basic solvents will differentiate the bases (level off the acids).

Since, all NH_3, CH_3NH_2 and $(CH_3)_2NH$ are bases. Thus, in acetic acid 100% proton transfer from acetic acid to these bases occur and all acids are seem equivalent in strength i.e. all are level off. Thus, Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 and $(CH_3)_2NH$.

Q. Identify the acid and base in the following reaction. Give reason.

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ [SbF_6]^-$$

A. According to Usanovich concept of acid-base,

An acid is any chemical species which -
i) react with base
ii) accepts anion or electron
iii) Furnish cations.

A base is any chemical species which -
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In the above reaction, SbF_5 accepts anion F^- i.e. SbF_5 acts as an acid. Again, XeF_6 donates anion F^- i.e. XeF_6 acts as a base in the above given reaction. Here acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+ [SbF_6]^-$.

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Sem: 1st
Date: 7/1/22

1. Reaction a between CaO and P_4O_{10} in molten state is an acid-base reaction
... Explain by a theory of your choice

According to Lux-Flood, acids are always oxide ion acceptors and bases are oxide ion donnors. The acids and bases are related as oxide ion transfer.

$$6CaO \rightleftharpoons 6Ca^{2+} + 6O^{2-}$$
$$2P_2O_5 + 6O^{2-} \rightleftharpoons 4PO_4^{3-}$$
$$\overline{6CaO + 2P_2O_5 \rightarrow 2Ca_2(PO_4)_2}$$

In the above reaction, CaO donates O^{2-} i.e. it acts as a base P_4O_{10} i.e $2P_2O_5$ accepts O^{2-} i.e. it acts as a acid. Thus, the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid-base.

2. Acetic acid cannot be used as a solvent to determine the relative strengths of bases NH_3, CH_3, $\delta(CH_3)$, HH .... explain

If the reference base i.e. solvent is a very good proton acceptor then for different acids, the extend of proton transfer may occurs about 100%. This is, the acids are completly dissociated. Such solvents i.e. reference base are referred to as leveling solvents with respect to the acid.

To differentiate the acid strengths of acid, a weak proton acceptor (weak acid) is to be taken as the reference solvent and to level the acids strengths, a good proton acceptor is to be taken as a reference i.e. acidic solvent will level off the bases (differentiate the acid) while the basic solvents will differentiate the bases (level off the acid)

Since, all NH_3, CH_3NH_2 $\delta(CH_3)$, HH are bases. In acetic acid 100% proton transfer from acetic acid to these bases occurs and all acid are seen equivalent in strenght i.e all are level off. Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3, $\delta(CH_3)_2$ NH.

3. Identify the acid and base in the following reaction. Give reason

$$XeF_6 + SbF_5 \longrightarrow [XeF_5]^+ + [SbF_6]^-$$

According to Usanovich concept of acid base,
An acid is any chemical species which
iv) Which react with base
v) Accepts anion or electron
vi) Furnish cations.

A base is any chemical special which—

iv) which react with acid

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In the above reations, SbF_5 accepts anion F^- i.e. SbF_5 acts as an acid. Again, XeF_6 donates anion F^- i.e. XeF_6 acts as a base in the above given reaction, Here acid SbF_5 reacts with base XeF_6 and form salt $[XeF_5]^+[SbF_6]^-$.

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1. Reaction between CaO and P_4O_{10} in molten state is a acid Base reaction .... Explain By a theory of your choice.

⇒ According to Lux-Flood, acids ~~ion~~ are always oxide ion acceptor and bases are oxide ion donor. The acids and bases are related as oxide ion transfer.

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2. Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3, CH_3NH_2 & $(CH_3)_2NH$ ..... explain.

⇒ If the reference base solvent is a very good proton acceptor then for different acids, the extent of proton transfer may occur about - 100%. that is, the acids are completely dissociated. If it occurs so, then all such acids appear to be equally strong. Such solvents reference base are referred to as leveling solvents with respect to the acid.

To differentiate the acid strengths of acids, a weak proton acceptor is to be taken as the reference solvent and to Level the acids strengths, a good proton acceptor is to be taken as a reference solverd. acidic solvents will level off the bases while the basic solvents will differentiate the bases.

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3. Identify the acid and base in the following reaction. Give reason. $XeF_6 + SbF_5 \rightarrow [XeF_5] + [SbF_6]$

⇒ According to usanovich concept of acid-base

(iv) Which react with base
(v) Accepts anion or electron
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A base is any chemical species which -

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In the avobe reaction SbF_5 accepts anion F^-. SbF_5 acts as an acid. Again, XeF_6 donates anion F^-. ~~SbF~~ XeF_5 acts as a base in the above given reaction. Here acid SbF_5 reacts with base XeF_5 and from salt $[XeF_5]^+[SbF_6]^-$