

Dr. Dasarath Mal

SEM -1

ACIDS & BASES

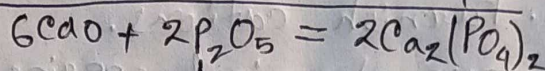
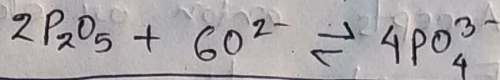
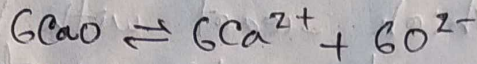
Name - Mrinmoy Samadder

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.



In the above reaction, CaO donates O^{2-} i.e. it acts as a base. P_4O_{10} i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. it acts as an acid. Thus, the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid base.

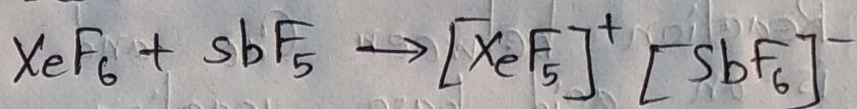
② Acetic Acid cannot be used as the solvent to determine the relative strengths of bases NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$ -- explain

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 equally 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 (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 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 $(\text{CH}_3)_2\text{NH}$ 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 $(\text{CH}_3)_2\text{NH}$.

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



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 $[\text{XeF}_5]^+ [\text{SbF}_6]^-$

Name - Amit Paul

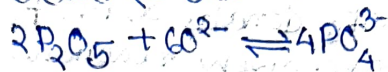
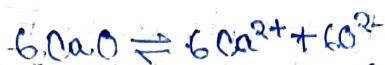
Semester - 1st

College - Vijaygarh Jyotish Roy College

Roll - 20211374

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 acceptors and bases are oxide ion donors. The acids and bases are related as oxide ion transfer.



In the above reaction, CaO donates O^{2-} i.e. It acts as a base. P_4O_{10} i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. It acts as an 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 strengths of bases NH_3 , CH_3NH_2 , and $(\text{CH}_3)_2\text{NH}$... 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, they 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 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. basic solvent. Basic solvents will level off the acids (differentiate the bases) while the acidic solvents will differentiate the acids (level off the bases).

Since, all NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$ are bases. Thus in acetic acid 100% proton transfer from acetic acid to these bases occurs and all acids are seen equivalent in strength. ~~relative strengths of bases~~ 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 $(\text{CH}_3)_2\text{NH}$.

Q3) Identify the acid-base in the following reaction. Give reason.
 $\text{XeF}_6 + \text{O}(\text{C}_2\text{H}_5)_2 \rightarrow [\text{XeF}_5]^+ [\text{O}(\text{C}_2\text{H}_5)_2]^-$

Ans - According to Lewis 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 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 $[\text{XeF}_5]^+ [\text{SbF}_6]^-$

Name - Anushka Ghosh

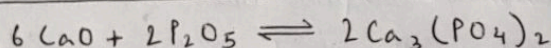
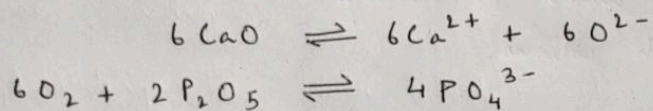
Roll - 20211244

Semester - 1st

College - Vijaygarh Jyotish Ray College

Q15) 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,



In the above reaction, CaO donates O^{2-} i.e. it acts as a base. P_4O_{10} i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. 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 $(\text{CH}_3)_2\text{NH}$. 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 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 $(\text{CH}_3)_2\text{NH}$ 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 strength of bases NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$.

Q17) Identify the acids and bases in the following reaction.
Give reason: $\text{XeF}_6 + \text{SbF}_5 \rightarrow [\text{XeF}_5]^+ [\text{SbF}_6]^-$

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
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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 $[\text{XeF}_5]^+ [\text{SbF}_6]^-$

Name - Anushka Ghosh

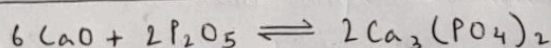
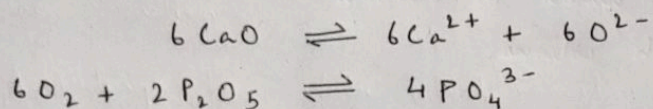
Roll - 20211244

Semester - 1st

College - Vijaygarh Jyotish Ray College

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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 $(\text{CH}_3)_2\text{NH}$ 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 strength of bases NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$.

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

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

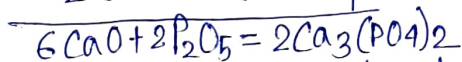
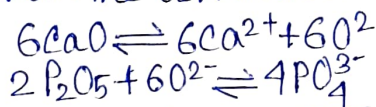
A base is any chemical species which —

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

In the above reaction, SbF_5 accepts anion F^- 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 $[XeF_5]^+ [SbF_6]^-$

Q. Reaction between CaO and P_2O_5 in molten state is an acid-base reaction.

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



In the above reaction, CaO donates O^{2-} i.e. if acts as a base. P_2O_5 i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. if acts as an 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 $(\text{CH}_3)_2\text{NH}$. --- 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 equally strong. Such solvents i.e. referentiate base are referred to as levelling solvents with respect to the acid.

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Q. Identify the acid and base in the following reaction. Give reason
 $\text{XeF}_6 + \text{SbF}_5 \rightarrow [\text{XeF}_5]^+ [\text{SbF}_6]^-$

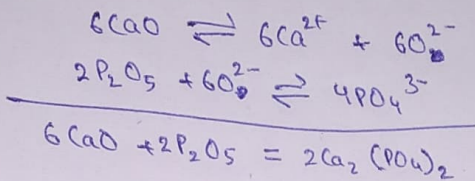
Ans: According to Usanovich concept of acid-base, An acid is any chemical species which -
 i) react with base
 ii) accepts anion or electron.
 iii) furnish cations

A base is any chemical species which -
 i) react with acid
 ii) furnish anion or electron
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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. $[\text{XeF}_5]^+ [\text{SbF}_6]^-$.

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 acceptors and bases are oxide ion donors. The acids and bases are related as oxide ion transfer



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

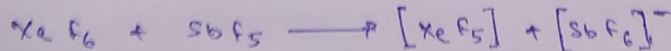
Q2. Acetic Acid can't be used as the solvent to determine the relative strength of bases NH_3 , CH_3NH_2 & $(\text{CH}_3)_2\text{NH}$. Explain.

- 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~~ completely dissociated. If it ~~occurs~~ occurs so then all such acids appear to be equally strong. Such ~~solvents~~ ^{solvents} (reference base) are referred to as leveling solvents w.r.t. an acid.

To differentiate the acid strengths of an acid, a weak proton acceptor is to be taken as the reference ~~base~~ 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 ~~to~~ (differentiate ~~to~~ the acid) while basic solvents will differentiate the bases (level off the acid).

Since, all NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$ are bases ~~to~~ thus, in ~~acetic~~ 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 & $(\text{CH}_3)_2\text{NH}$

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



According to usanovich theory 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. Hence acid SbF_5 reacts with base XeF_6 and form salt $[\text{XeF}_5]^+ [\text{SbF}_6]^-$

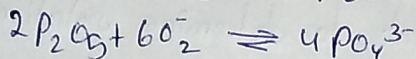
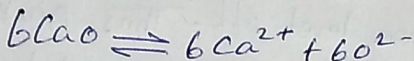
Name = Abhayshankar Jha.

Roll no = 20211181

1st semester.

1) Reaction between CaO & P_2O_5 in molten state in an acid-base reaction. Explain a theory.

→ According to Lux Flood acid base theory, acids are always oxid ion acceptors and bases are always oxid ion donors. The acid and base are related as oxide ion transfer.



In the above reaction $\text{CaO} + 2\text{P}_2\text{O}_5 = 2\text{Ca}_2(\text{PO}_4)_2$ as a base i.e., CaO donates O^{2-} i.e. it acts thus the above reaction is nothing but an acid-base reaction according to lux-flood concept.

2) Acidic acid cannot be used as the solvent to determine the relative strength of base NH_2 and $(\text{CH}_3)_2\text{NH}$ explain.

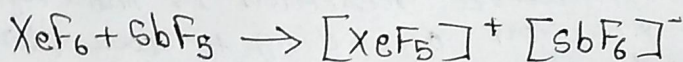
→ If the reference base i.e. solvent is very good proton acceptor. then for different acids, the extent of proton transfer may occur about 100%. That is acids are completely dissociated. If it occurs so, then all such acids are completely dissociated. If it occurs so then all such acid appears to be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

To differentiate the acid strength of acids, a weak proton acceptor is to be taken the surface solvent and to level acid strengths; a good proton acceptor is to be taken as reference solvent i.e.

reference. ~~bas~~ are
acidic solvent will level of the ~~bases~~ bases.
(differentiate the acid) while the basic Solvents will
differentiate the bases (level off the acid)

Since, all $\text{NH}_3\text{CH}_3\text{NH}_2$ and $(\text{CH}_3)_2\text{NH}$ 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 $\text{NH}_3\text{CH}_3\text{NH}_2$ and $(\text{CH}_3)_2\text{NH}$.

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



According to Bronsted-Lowry Concept of acid base,

An acid is any chemical species which

- ① which react with base.
- ② Accepts anion or electron
- ③ Furnish cations.

A base is any chemical species which

- ① which react with acid
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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 $[\text{XeF}_5]^+ [\text{SbF}_6]^-$.

Name - Sanchita Saha.

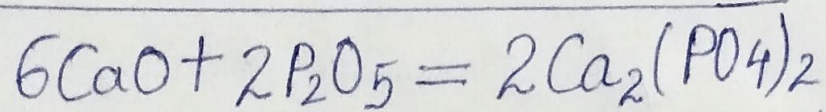
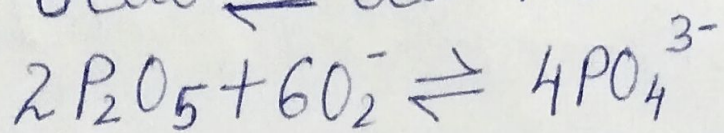
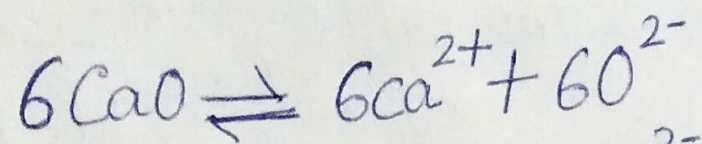
Semester - I

College - Vijaygarh Jyotish Ray College.

①

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

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



In the above reaction CaO donates O^{2-} i.e., it acts as a base i.e., $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e., it acts as an acid. Thus the above reaction is nothing but an acid-base reaction according to the Lux-Flood concept of acid-base.

2. Acidic acid cannot be used as the solvent to determine the relative strengths of bases NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$ explain.

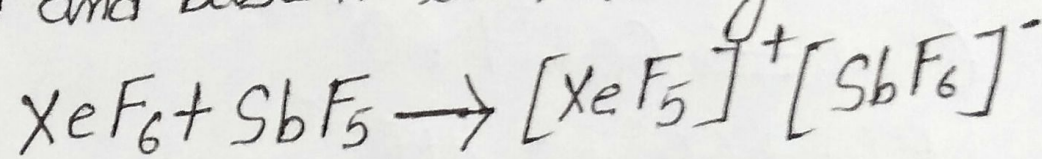
Ans → If the reference base i.e., solvent is a very good proton acceptor then for different acids, the extent of proton transfer may occur about 100%. That is acids are completely dissociated. If it occurs so, then all such acids appear to be equally strong. Such solvents i.e., reference base are referred to as 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 acid strengths; a good proton acceptor is to be taken as reference solvent. i.e., acidic solvents will level off the bases (differentiate the acid) while the basic solvents will differentiate the bases (level off the acids).

②

Since, all $\text{NH}_3\text{CH}_2\text{NH}_2$ and $(\text{CH}_3)_2\text{NH}$ 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 cannot be used as the solvent to determine relative strengths of base in $\text{NH}_3\text{CH}_2\text{NH}_2$ and $(\text{CH}_3)_2\text{NH}$.

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



According to Usanovich concept of acid base,
An acid is any chemical species which

- ① which react with base
- ② Accepts anion or electron
- ③ Furnish cations.

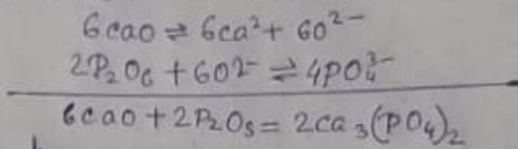
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15. Reaction between CaO and P_4O_{10} in molten state is an acid-base reaction
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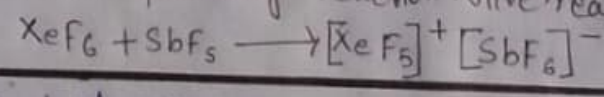
16. Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3 , CH_3NH_2 , & $(\text{CH}_3)_2\text{NH}$ explain.

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To differentiate the acid strengths 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 (level off the acids).

Since, all NH_3 , CH_3NH_2 & $(\text{CH}_3)_2\text{NH}$ 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_3 , & $(\text{CH}_3)_2\text{NH}$.

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



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 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 $[\text{XeF}_5]^+ [\text{SbF}_6]^-$.

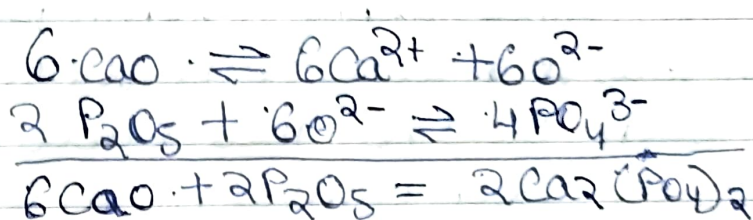
NAME: Soumaditya Roy

SEMESTER: 1st

COLLEGE: Vijaygadh Tyotish Ray College

1. 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 acceptors and bases are oxide ion donors. The acids and bases are related as oxide ion transfer.



In the above reaction CaO donates O^{2-} i.e. it acts as a base. P_4O_{10} i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. acts as an acid. Thus, the above reaction is nothing but an acid-base reaction according to the 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 & $(\text{CH}_3)_2\text{NH}$. Explain.

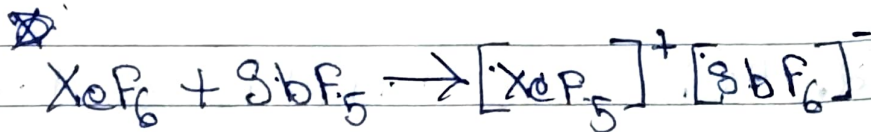
⇒ If the reference base solvent is a very good proton acceptor then for different acids the extent of proton transfer may occur about 100%. That is ~~they~~ ^{acids} are completely dissociated.

If it occurs so then all such acids appear to be equally strong. Such solvents i.e. reference bases are referred 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 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 (level off the acids).

Since all NH_3 , CH_3NH_2 , & $(\text{CH}_3)_2\text{NH}$ 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 & $(\text{CH}_3)_2\text{NH}$.

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



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] Form cations

Page _____

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^- 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 $[\text{XeF}_5]^+ [\text{SbF}_6]^-$

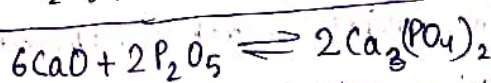
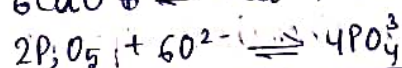
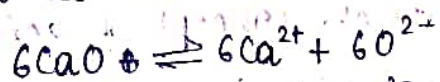
Name - Zeba Anwar

Semester - 1st

College - Vijaygarh 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 acceptors and bases are oxide ion donors. The acids and bases are related as oxide ion transfer,



In the above reaction, CaO donates O^{2-} i.e., it acts as a base. P_4O_{10} i.e., $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e., it acts as an 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 $(\text{CH}_3)_2\text{NH}$... 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 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 $(\text{CH}_3)_2\text{NH}$ are bases. Thus, in acetic acid 100% proton transfer from acetic acid to the

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 and $(\text{CH}_3)_2\text{NH}$.

Q2 Identify the acids and bases in the following reactions. Give reason - $\text{XeF}_6 + \text{SbF}_5 \rightarrow [\text{XeF}_5]^+ [\text{SbF}_6]^-$

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.

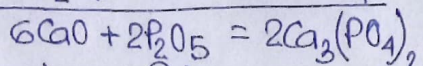
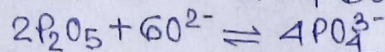
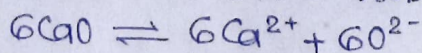
A base is any chemical species which -

- (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^- 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 $[\text{XeF}_5]^+ [\text{SbF}_6]^-$

Q. Reaction between CaO and P_2O_5 in molten state is an acid base reaction.

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



In the above reaction, CaO donates O^{2-} i.e. if acts as a base. P_2O_5 i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. if acts as an 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 $(\text{CH}_3)_2\text{NH}$ explain.

→ If the reference base i.e. solvent is very good proton acceptor than different acids, the extent of proton transfer may occur 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 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.

Since, all NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$ are bases. Thus, in acetic acid 100% proton transfer from acetic acid to these bases occurs 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 , $(\text{CH}_3)_2\text{NH}$.

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



→ According to Usenich concept of acid-base,

An acid is any chemical species which -

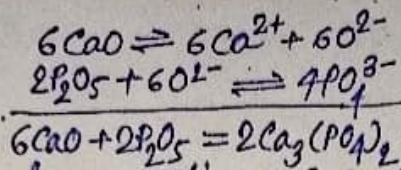
- (i) react with base, (ii) accepts e^- , (iii) furnish cation

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 $[\text{XeF}_6]^+ [\text{SbF}_6]^-$.

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.



In the above reaction, CaO donates O^{2-} i.e. it acts as a base. P_4O_{10} i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. it acts as an acid. Thus, the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid-base.

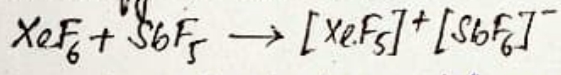
Q. Acetic acid cannot be used as the solvent to determine the relative strengths of bases NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$... explain.

A. 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 equally strong. Such solvents i.e. reference base are referred 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 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 (level off the acids).

Since, all NH_3 , CH_3NH_2 and $(\text{CH}_3)_2\text{NH}$ 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 and $(\text{CH}_3)_2\text{NH}$.

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



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 -
 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 $[\text{XeF}_5]^+ [\text{SbF}_6]^-$.

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Roll: 20210119

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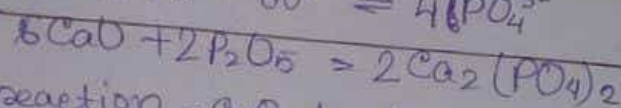
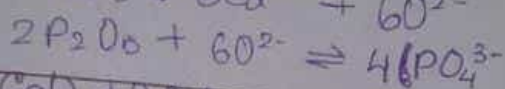
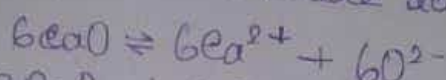
Sem: 1st

Date: 7/1/22

1. Reaction between CaO and P_2O_5 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 donors. The acids and bases are related as oxide ion transfer.



In the above reaction, CaO donates O^{2-} i.e. it acts as a base. P_2O_5 i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. it acts as an acid. Thus, the above reaction is nothing but an acid-base reaction according to Lux-Flood concept of acid-base.

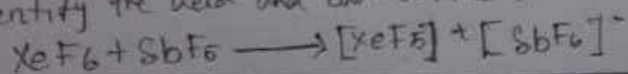
2. Acetic acid cannot be used as a solvent to determine the relative strengths of bases NH_3 , CH_3 , $\delta(\text{C}_2\text{H}_5)$, NH ... explain

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%. This is, the acids are completely 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 strength, 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 , $\delta(\text{C}_2\text{H}_5)$, NH are bases. In acetic acid 100% proton transfer from acetic acid to these bases occurs and all are seen equivalent in strength 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 , $\delta(\text{C}_2\text{H}_5)$, NH .

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



According to Usanovich concept of acid base,

An acid is any chemical species which

- i) which react with base
- v) Accepts anion or electron
- vi) Furnish cations.

A base is any chemical species which—

- i) which react with acid
- v) furnish anion or electron
- vi) Accepts cations.

In the above reactions, 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. Hence acid SbF_5 reacts with base XeF_6 and form salt $[\text{XeF}_5]^+ [\text{SbF}_6]^-$.

Name - Susanta Kayal

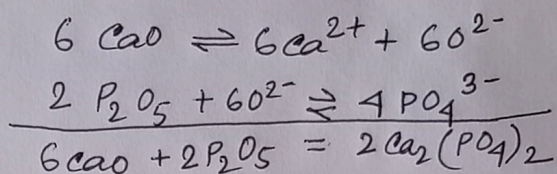
Semester - 1st

College - Vijaygarh Jayotish Ray College

Roll NO - 451111008
20210346

1. Reaction between CaO and P_4O_{10} in molten state in 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 donors. The acids and bases are related as oxide ion transfer.



In the above reaction, CaO donates O^{2-} i.e. it acts as a base. P_4O_{10} i.e. $2\text{P}_2\text{O}_5$ accepts O^{2-} i.e. acts as an acid. Thus, the above reaction is nothing but an acid-base reaction according to the 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 & $(\text{CH}_3)_2\text{NH}$... 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 acid strengths, a good proton acceptor is to be taken as a reference solvent. Acidic solvents will level off the bases while the basic solvents will differentiate the bases.

Since, all NH_3 , CH_3NH_2 & $(\text{CH}_3)_2\text{NH}$ are bases. Thus in acetic acid 100% proton transfer from acetic acid to these bases occurs and all acids are seen equivalent in strength 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 & $(\text{CH}_3)_2\text{NH}$.

3. Identify the acid and base in the following reaction. Give reason. $\text{XeF}_6 + \text{SbF}_5 \rightarrow [\text{XeF}_5]^+ + [\text{SbF}_6]^-$

⇒ According to usanovich concept of acid-base

(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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In the above reaction SbF_5 accepts anion F^- . SbF_5 acts as an acid. Again, XeF_6 donates anion F^- . XeF_6 acts as a base in the above given reaction. Hence acid SbF_5 reacts with base XeF_6 and form salt $[\text{XeF}_5]^+ [\text{SbF}_6]^-$