

## Hints And Tricks For Etea

### Hints And Tricks For Etea

1) Which one can form more acidic oxides?

- A) Sc
- B) Mn
- C) Ti
- D) V

**Solution:**

Mn is at the right side of the periodic table and also attain maximum oxidation state of +7. So Mn will form more acidic oxides among the above metals. Hence option B is correct.

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2) The number of peaks given by ethane thiol in NMR spectrum are

- A) 2
- B) 3
- C) 4
- D) None of the above

**Solution:**

As there are three different regions for hydrogens so three peaks will be given. Option B is correct.

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3) Which one is more soluble in water?

- A) Secondary amines
- B) Tertiary amines
- C) Quaternary amines
- D) All are insoluble

**Option A is correct**

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4)  $C_4H_{11}N$  gives the type of isomerism

- A) Metamerism
- B) Tautomerism
- C) Optical Isomerism

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D) None of the above

**Solution:**

Metamerism is shown. Like

1)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-NH-CH}_3$

2)  $\text{CH}_3\text{-CH}_2\text{-NH-CH}_2\text{-CH}_3$

Option A is correct.

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5) Which of the following specie has maximum number of unpaired electrons?

A)  $\text{O}_2$

B)  $\text{O}_2^{+2}$

C)  $\text{O}^{-2}$

D)  $\text{O}_2^{-2}$

**Solution:**

Unpaired electrons in  $\text{O}_2=2$

Unpaired electrons in  $\text{O}_2^{+2}=0$

Unpaired electrons in  $\text{O}^{-2}=0$

Unpaired electrons in  $\text{O}_2^{-2}=0$

So option A is correct.

---

6) A mixture of  $10\text{cm}^3$  of oxygen and  $50\text{cm}^3$  of hydrogen is sparked continuously. What is the maximum theoretical decrease in volume?

A)  $10\text{ cm}^3$

B)  $15\text{ cm}^3$

C)  $20\text{ cm}^3$

D)  $30\text{ cm}^3$

**Solution:**



Now

Total reactants Volume= $10+50$

Total reactants Volume= $60\text{cm}^3$

Similarly

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Total product Volume=20cm<sup>3</sup>

Volume used of Reactants=20+10

Volume used of reactants=30cm<sup>3</sup>

Remaining volume of reactants=60-30

Remaining volume of reactants=30cm<sup>3</sup>

So

Total volume of the mixture=reactants + products

Total volume of the mixture=30+20

Total volume of the mixture=50cm<sup>3</sup>

Thus

Decrease in volume=60-50

Decrease in volume=10cm<sup>3</sup>

So option A is correct

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7) Hydration of hydrocarbon gives carbonyl compound, the general formula of that hydrocarbon is

A) C<sub>n</sub>H<sub>2n+2</sub>

B) C<sub>n</sub>H<sub>2n</sub>

C) C<sub>n</sub>H<sub>2n-2</sub>

D) Both B and C

**Solution:**

Hydration of alkynes only produced carbonyl compound so the correct option is C

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8) The oxidation states of nitrogen in NH<sub>4</sub>NO<sub>3</sub> are

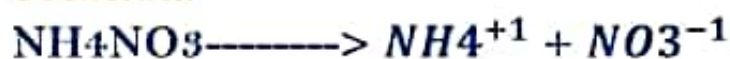
A) -3 and +5

B) +5 and -3

C) -3 and -3

D) Zero

**Solution:**



Now



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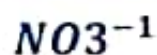
$$N+4H=+1$$

$$N+4(+1)=+1$$

$$N+4=+1$$

$$N=-3$$

Similarly



$$N+3(-2)=-1$$

$$N-6=-1$$

$$N=+5$$

Hence option A is correct

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9) Coordination number of  $[Co(en)_2Cl_2]$  is

A) -2

B) 6

C) 4

D) None of the above

**Solution:**

As "en" has four atoms attached to cobalt as it is bidentate ligands. While two chlorine are also attached so total 6 atoms are attached with cobalt. Thus 6 is the coordination number. Option B is correct

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10) An olefin "X" on ozonolysis gives  $CH_3-CH_2-CO-CH_3$  and  $CH_3-CO-CH_3$ . The IUPAC name of X is

A) 2-butene

B) 2, 3-dimethyl-2-pentene

C) 2-pentene

D) 1-hexene

**Solution:**

As total seven carbons are present on the product side. It mean the "X" must have seven carbons. Thus correct option is B. No need to further calculation.

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11) Which one of the following element has the largest

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second ionization energy?

- A) O
- B) F
- C) Na
- D) Ne

**Solution:**

O =  $1s^2, 2s^2, 2p^4$  — Ground state

$O^{+1} = 1s^2, 2s^2, 2p^3$  — 1st ionized state

F =  $1s^2, 2s^2, 2p^5$  — Ground state

$F^{+1} = 1s^2, 2s^2, 2p^4$  — 1st ionized state

Na =  $1s^2, 2s^2, 2p^6, 3s^1$  — Ground state

$Na^{+1} = 1s^2, 2s^2, 2p^6$  — 1st ionized state

Ne =  $1s^2, 2s^2, 2p^6$  — Ground state

$Ne^{+1} = 1s^2, 2s^2, 2p^5$  — 1st ionized state

As half filled and complete filled orbitals are more stable. So oxygen has half filled orbitals while Na has complete filled after 1st ionization. Now complete filled is more stable than half filled thus Na has the highest second ionization energy. So option C is correct.

---

12) Which oxides of "K" contain more oxygen than its normal oxide?

- A) Peroxides
- B) Super oxides
- C) Both contain equal quantity
- D) None of the above

**Solution:**

1) Peroxide,  $K_2O_2$

Molar mass =  $2 \times 39 + 2 \times 16$

Molar mass =  $78 + 32$

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Molar mass = 110

Now

% of oxygen =  $32 \times 100 / 110$

% of oxygen =  $3200 / 110$

% of oxygen = 29.09%

2) Superoxide  $\text{KO}_2$

Molar mass =  $39 + 2 \times 16$

Molar mass =  $39 + 32$

Molar mass = 71

Now

% of oxygen =  $32 \times 100 / 71$

% of oxygen = 45.07%

Thus option B is correct.

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13) Which ions are used as a catalyst in the reaction between per sulphate ions and iodine ions?

A) Lead

B) Iron

C) Copper

D) Chromium

**Option B is correct**

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14) Which one is stronger nucleophile?

A)  $\text{C}_2\text{H}_5\text{O}^{-1}$

B)  $\text{C}_2\text{H}_5\text{S}^{-1}$

C) Both are equal strong

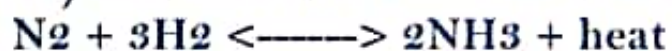
D) None of the above

**Solution:**

As S is more electropositive and easily give electrons thus Option B is correct

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15) Consider the reversible reaction



The yield of  $\text{NH}_3$  will be maximum at

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- A) High temperature and low pressure
- B) High temperature and high pressure
- C) Low temperature and low pressure
- D) Low temperature and high pressure

### **Solution:**

As the reaction is exothermic so low temperature will proceed the reaction in forward direction. As reactants moles are greater than product so high pressure will also proceed the reaction in forward direction. So option D is correct

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16) Which of the following concentration units is temperature dependant?

- A) Molality
- B) Mole fraction
- C) Molarity
- D) Both A and C

### **Hint:**

Molarity has volume in its formula. That's why It is temperature dependant. So option C is correct.

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17) Tertiary alcohols are not oxidized into carbonyl compounds because

- A) They contain more alkyl groups
- B) They have no alpha hydrogen
- C) Suitable oxidizing agents are not available
- D) None of the above

### **Reason:**

As there is no alpha hydrogen in tertiary alcohols that's why they are not oxidized into carbonyl compounds.

Option B is correct

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18) Which one is most reactive?

- A) HCHO

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- B)  $\text{CH}_3\text{CHO}$
- C)  $(\text{CH}_3)_2\text{CO}$
- D) Have equal reactivity

**Solution:**

As aldehydes are more reactive than ketones. Now formaldehyde is most reactive among the other aldehydes so option A is correct.

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19) Which of the following is not the major source of organic compounds?

- A) Natural gas
- B) Petroleum
- C) Coal
- D) Ammonical liquor

**Option D is correct.**

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20) Which of the following is not a state function?

- A) Work
- B) Enthalpy
- C) Internal energy
- D) Pressure

**Option A is correct.**

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21) How many elements are there in the 3rd period of periodic table?

- A) 18
- B) 8
- C) 32
- D) 10

**Solution:**

1st period=2

2nd period=8

3rd period=8

4th period=18



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5th period=18

6th period=32

7th period=32

So option B is correct.

---

22) The number of isomers of pentane is

A) 2

B) 4

C) 5

D) 3

**Option D is correct.**

1)  $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-CH}_3$

2)  $\text{CH}_3\text{-CH}_2\text{-CH-CH}_3$



3)  $\text{CH}_3\text{-CH-CH}_3$



23) When ammonium cyanide ( $\text{NH}_4\text{CN}$ ) salt is dissolved in water, the solution will be

A) Neutral

B) Acidic

C) Basic

D) Both B and C

**Solution:**

As  $\text{CN}^{-1}$  is stronger as a base than  $\text{NH}_4^{+}$  as an acid.

That why when  $\text{NH}_4\text{CN}$  salt is dissolved in water the solution will be basic in nature. So option C is correct

---

24) In the complex potassium hexacyanoferrate(III),  $\text{K}_3[\text{Fe}(\text{CN})_6]$ , the coordination number of Fe is

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- A) 9
- B) 3
- C) 6
- D) 5

### **Solution:**

Six molecules of CN are attached with Fe. So Fe has coordination number of 6. Option C is correct.

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25) The compound which has the highest boiling point of the following is

- A) Methyl chloride
- B) Methyl iodide
- C) Methyl bromide
- D) Both A and B

### **Solution:**

As when size of the halogen increases by keeping the alkyl group constant, boiling point will also be increases. So Option B is correct.

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26) Which of the following is an addition polymer?

- A) Nylon
- B) PVC
- C) Polyethene
- D) Both B and C

**Option D is correct.**

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27) Photochemical smog is primarily caused by

- A) O<sub>3</sub>
- B) NO<sub>2</sub>
- C) SO<sub>3</sub>
- D) CO<sub>2</sub>

**Option B is correct**

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28) Which of the following pair is an example of

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completely immiscible liquids?

- A) Alcohol and water
- B) Alcohol and ether
- C) Water and ether
- D) Carbon disulphide and water.

### **Hint:**

Like dissolve like. As carbon disulphide is non polar while water is polar so these two are completely immiscible liquid. Option D is correct.

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29) A molecule which contains two lone pairs and two bonds pairs of electrons in valence shell of central atom, geometrical shape of the molecule will be

- A) Tetrahedral
- B) Trigonal pyramidal
- C) Angular
- D) Linear

### **Solution:**

As two bond pairs means two atoms will be attached thus

$H = \text{Lone pair} + \text{attached atoms}$

$$H = 2 + 2$$

$$H = 4$$

It means molecule has  $sp^3$  hybridization.

When hybridization is  $sp^3$  and having two lone pairs then geometry will be Angular. So option C is correct.

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30) Quantum number which describes the orientation of orbitals in three dimensional space is

- A) Spin Q.No
- B) Magnetic Q.No
- C) Azimuthal Q.No
- D) Principal Q.No

Here option B is correct

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31) Which of the following gas has the highest rate of diffusion at the same temperature and pressure?

- A) HCl
- B) CO<sub>2</sub>
- C) C<sub>2</sub>H<sub>2</sub>
- D) C<sub>2</sub>H<sub>6</sub>

**Solution:**

As rate of diffusion is inversely proportional to the square root of the molar mass. Higher the molar mass, lower will be the rate of diffusion and vice versa

Now

HCl=36.5 amu

CO<sub>2</sub>=44 amu

C<sub>2</sub>H<sub>2</sub>=26 amu

C<sub>2</sub>H<sub>6</sub>=30 amu

So Option C is correct.

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32) At higher altitude the boiling point of water is less than 100°C. This is because of

- A) Higher atmospheric pressure
- B) Weak hydrogen bonding
- C) No change in atmospheric pressure
- D) Lower atmospheric pressure

Hint:

Boiling point decreases at high altitudes due to lower atmospheric pressure. So option D is correct.

---

33) Substance that has sharp melting point in the following is

- A) Gemstone
- B) Coal tar
- C) Glass
- D) Diamond

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Hint:

Crystalline substances have sharp melting points. Here Diamond is crystalline so it has sharp melting point. Option D is correct.

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34) The enzyme which is found in saliva, accelerates the conversion of starch into sugar is

- A) Pepsin
- B) Thrombin
- C) Ptyalin
- D) Fumarase

**Correct option is C**

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35) Which compound shows the highest boiling point?

- A)  $\text{CH}_3\text{COOH}$
- B)  $\text{C}_2\text{H}_5\text{OH}$
- C)  $\text{C}_2\text{H}_5\text{-O-C}_2\text{H}_5$
- D)  $(\text{CH}_3\text{-CH}_2)_3\text{-N}$

**Solution:**

Compounds having H.bonding will have highest boiling point. Here alcohol and carboxylic acid have hydrogen bonds. But hydrogen bonds are maximum in carboxylic acids. So option A is correct

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36) Which of the following pollutant decolorize the skin?

- A) Mercury
- B) Arsenic
- C) Lead
- D) Cadmium

**Correct option is B**

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37) As the polarizing power of the cation increases, thermal stability of carbonates

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- A) Increases
- B) Decreases
- C) Not dependent
- D) Depends upon pressure

**Solution:**

Thermal stability of the carbonates are inversely proportional to the polarizing power of the cation. Greater the polarizing power of the cation, lesser will be the thermal stability and vice versa. So option B is correct

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38) Ozone layer in the upper atmosphere is being destroyed by

- A) Chlorofluorocarbon
- B) Freon
- C) Smog
- D) Both A and B

**Correct option is D**

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39) When zinc electrode is coupled with copper electrode in galvanic cell

- A) Reduction takes place at zinc electrode
- B) Oxidation takes place at copper electrode
- C) Reduction takes place at copper electrode
- D) Both A and B

**Solution:** As reduction potential of Zn is less than that of copper. There fore Zn will acts as an Anode while Copper acts as Cathode. At the Anode oxidation will occur while at the Cathode reduction will occur Thus Correct option is C

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40) Which contains more atoms?

- A) 7 grams Mg
- B) 8 grams Na

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C) 9 grams Al

D) All same

**Solution:**

As greater the number of moles, greater will be the atoms.

For Mg:

$$\text{Moles} = 7/24$$

$$\text{Moles} = 0.29$$

For Na:

$$\text{Moles} = 8/23$$

$$\text{Moles} = 0.34$$

For Al

$$\text{Moles} = 9/27$$

$$\text{Moles} = 0.33$$

Thus Na has greater moles, so more atoms will be present in 8 grams of Na. Option B is correct

---

41) Which contains the highest percentage of nitrogen?

A) NO

B) NO<sub>2</sub>

C) N<sub>2</sub>O

D) N<sub>2</sub>O<sub>5</sub>

**Solution:**

$$\% \text{ of nitrogen in NO} = 14 \times 100 / 30$$

$$\% \text{ of nitrogen in NO} = 46.66\%$$

Similarly

$$\% \text{ of nitrogen in NO}_2 = 14 \times 100 / 46$$

$$\% \text{ of nitrogen in NO}_2 = 30.43\%$$

Similarly

$$\% \text{ of nitrogen in N}_2\text{O} = 28 \times 100 / 44$$

$$\% \text{ of nitrogen in N}_2\text{O} = 63.73\%$$

Similarly

$$\% \text{ of nitrogen in N}_2\text{O}_5 = 28 \times 100 / 108$$

$$\% \text{ of nitrogen in N}_2\text{O}_5 = 29.52\%$$

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Thus Option C is correct

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42)  $\text{Fe}^{+2}$  will form the most ionic bond with

A)  $\text{N}^{-3}$

B)  $\text{S}^{-2}$

C)  $\text{P}^{-3}$

D)  $\text{F}^{-1}$

**Solution:**

As size of the anion increases, ionic character will be decreases. Here  $\text{F}^{-1}$  has smaller size so it will form the most ionic bond with  $\text{Fe}^{+2}$ . So correct option is D

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43) Which of the following element has lowest first ionization energy?

A) N

B) O

C) C

D) B

**Solution:**

As I.E increases across the period so Boron has the lowest first Ionization energy. Option D is correct

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44) A gas diffuse  $1/2$  times as fast as hydrogen, its molecular mass is

A) 50 amu

B) 25 amu

C) 16 amu

D) 8 amu

**Solution:**

$$\frac{r_1}{r_2} = \sqrt{\frac{M_2}{M_1}}$$

$$\frac{1}{2} = \sqrt{\frac{M_2}{2}}$$



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$$2 = \sqrt{\frac{M_2}{2}}$$

Taking square on both sides, we get

$$4 = M_2/2$$

$$M_2 = 8$$

Thus correct option is D

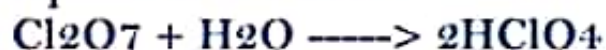
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45) The anhydride of  $\text{HClO}_4$  is

- A)  $\text{ClO}_3$
- B)  $\text{ClO}_2$
- C)  $\text{Cl}_2\text{O}_5$
- D)  $\text{Cl}_2\text{O}_7$

**Solution:**

As  $\text{HClO}_4$  is the strong acid so it will form from the most acidic oxide.  $\text{Cl}_2\text{O}_7$  is the most acidic oxide so Option D is correct.



46) Consider reversibility in free radical substitution reaction of alkane then  $K_c$  value is smallest for

- A) Initiation step
- B) Propagation step
- C) Termination step
- D) All same

**Correct option is A**

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47) Ethylene diaminediacetate is

- A) Didentate
- B) Tridentate
- C) Tetradentate
- D) Hexadentate

**Correct option is C**

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48) Epoxide obtained from iso-butylene is further

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hydrolysed in the presence of acid. The final product is

- A) 2, 3-butandiol
- B) 1, 2-butandiol
- C) 2-methyl-1, 2-propandiol
- D) All of them

**Solution:** By acid hydrolysis, epoxides give glycols. Here Iso-butylene is given so glycol will have three carbons in its chain thus correct option is C

---

49) In the detection of nitrogen in the organic compound. The appearance of Prussian blue colouration is due to the formation of

- A)  $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
- B)  $\text{Na}_3[\text{Fe}(\text{CN})_6]$
- C)  $\text{K}_3[\text{Fe}(\text{CN})_6]$
- D) None of the above

**Option A is correct**

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50) The bond angle in  $\text{H}_2\text{S}$  is less than  $\text{H}_2\text{O}$ . It is due to

- A) Small size of oxygen atom
- B) Greater E.N of oxygen atom
- C) Oxygen contains two lone pairs of electrons
- D) All of the above

**Solution:**

When central atoms are different and surrounding atoms are same then bond angle will be greater for that molecule which has central atom of highest electronegativity and Vice versa. So Option B is correct.

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51) The auxochrome not concern with Metanil yellow dye

- A)  $-\text{SO}_3\text{H}$
- B)  $-\text{OH}$
- C)  $-\text{NH}_2$

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D) Both A and C

**Correct option is C**

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52) Which one is more reactive?

A) Ester

B) Acid halide

C) Amide

D) Acid anhydride

**Solution:**

All are the derivatives of carboxylic acid. Acid halide is the most reactive while Amide is the least reactive.

Option B is correct

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53) A gas decolorizes alkaline  $\text{KMnO}_4$  solution but does not give any ppt with ammonical  $\text{AgNO}_3$

A) Methane

B) Ethylene

C) Ethane

D) None of the above

**Solution:**

For the detection of double or triple bonds, beayer test is used which is alkaline  $\text{KMnO}_4$  solution. If double or triple bonds are present then the solution will be decolorize. As Ethene and ethyne both gives this test but ethene does not give ppt while ethyne gives ppt with ammonical  $\text{AgNO}_3$ . Thus Option B is correct.

---

54) Why ethanoic acid is a stronger acid in the liquid ammonia than in water?

A) Ammonia is stronger base than water

B) Ethanoic acid molecules form H.bonding with water

C) Ethanoic acid is more soluble in liquid ammonia than in water

D) None of the above

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Correct option is A

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55) Which equation relates to the first ionization energy of bromine?

- A)  $\text{Br} \rightarrow \text{Br}^- + 1\bar{e}$
- B)  $\text{Br} \rightarrow \text{Br}^+ + 1\bar{e}$
- C)  $\frac{1}{2}\text{Br}_2 \rightarrow \text{Br}^- + 1\bar{e}$
- D)  $\frac{1}{2}\text{Br}_2 \rightarrow \text{Br}^+ + 1\bar{e}$

Option D is correct

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56) For exothermic reversible reaction, activation energy for forward direction depends upon

- A) Temperature
- B) Nature of reactants
- C) Nature of products
- D) Both A and B

Correct option is B

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57) Which one of the following ion has more electrons than protons and more protons than neutrons?

- A) D
- B) D-
- C) H-
- D) He

**Solution:**

As H- has two electrons and one proton and Zero neutron thus Option C is correct

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58) Ice and water is in equilibrium with each other. By increasing the pressure the equilibrium will shift in

- A) Forward
- B) Reverse
- C) To all system at equilibrium

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D) None of the above

**Correct option is A**

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59) Steam causes severe burn than boiling water. It is due to

A) Absence of hydrogen bond

B) High latent heat of vaporization

C) Freely moving molecules

D) Statement is wrong

**Correct option is B**

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60) The incorrect statement regarding gas having high value of coefficient of attraction

A) Easy to be liquefied

B) Having higher critical temperature

C) Less soluble in water

D) None of the above

**Solution:**

When value of "a" is high then gases will have higher critical temperature, easy to be liquefied and will be more soluble in water. So

**Option C is correct**