

Subject: Chemistry

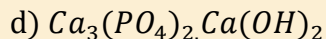
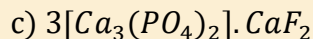
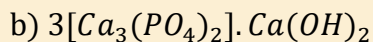
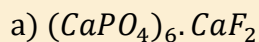
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4. Formula of hydroxyapatite is:



Ans: (b)

Solution

Correct formula of hydroxyapatite is $3[Ca_3(PO_4)_2] \cdot Ca(OH)_2$. Hydroxyapatite is the main component of the phosphate rocks.

Hence, b) is the correct answer.

5. Which polymer is made by novolac and formaldehyde addition?

a) Melamine

b) Bakelite

c) Polyester

d) None of the above

Ans: (b)

Solution

Novolac on heating with formaldehyde undergoes cross linking to form an infusible solid mass called bakelite.

Hence, the correct option is b).

6. Calculate the molarity of 3.3 molal solution of KCl whose density is 1.28 g/mL.

a) 3.7 M

b) 5.0 M

c) 3.4 M

d) 2.5 M

Ans: c)

Solution

Given,

$$\text{Molality} = 3.3 \text{ m}$$

$$\text{Density} = 1.28 \text{ g/mL}$$

By using formula,

$$\text{Molality(m)} = \frac{M \times 1000}{1000 \times d - M \times M_{\text{solute}}}$$

$$3.3 = \frac{M \times 1000}{1000 \times 1.28 - M \times 74.5}$$

$$4224 - 245.85M = 1000M$$

$$1245.85M = 4224$$

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$$M = \frac{4224}{1245.85} = 3.39 \approx 3.4 \text{ M}$$

Hence, the correct option is c).

7. Suitable method to deionize water is:

- a) Synthetic resin
- b) Calgon
- c) Permutit method
- d) Clark's method

Ans: a)

Solution

Pure demineralised (de-ionized) water free from all soluble mineral salts is obtained by passing water successively through a cation exchange (in the H^+ form) and an anion exchange (in the OH^- form) resins.

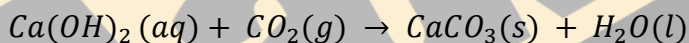
Hence, the correct option is a).

8. When excess of CO_2 is passed through lime water then what will be the sequence of the product?

- a) $Ca(HCO_3)_2, CaO$
- b) $CaO, Ca(HCO_3)_2$
- c) $CaCO_3, Ca(HCO_3)_2$
- d) $Ca(HCO_3)_2, CaO$

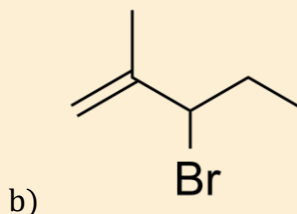
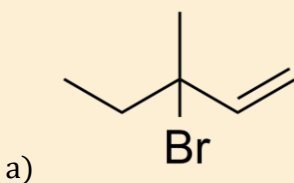
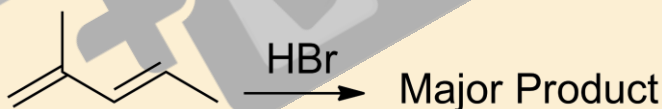
Ans: c)

Solution



Hence, the correct option is c).

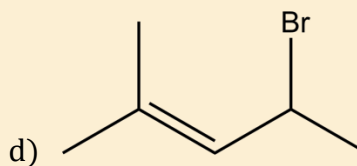
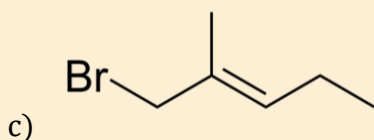
9. Predict the major product for the following reaction:



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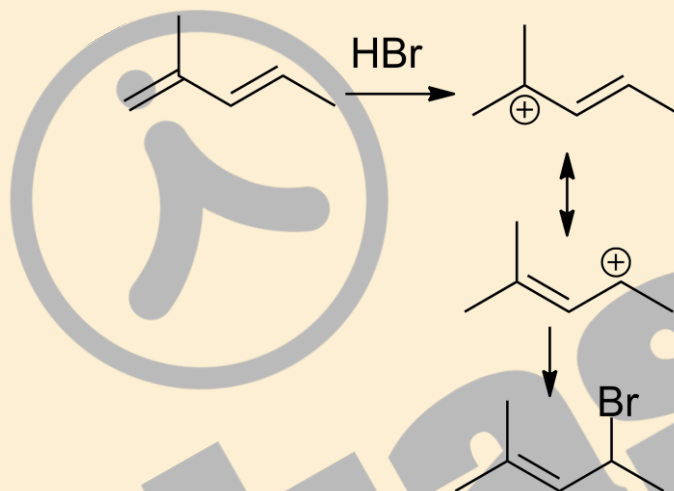


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Ans: (d)

Solution



10. For adsorption of a gas:

a) $\Delta H < 0, \Delta S < 0$

b) $\Delta H < 0, \Delta S > 0$

c) $\Delta H > 0, \Delta S > 0$

d) $\Delta H = 0, \Delta S > 0$

Ans: (a)

Solution

During adsorption, there is always a decrease in residual forces of the surface, i.e., there is decrease in surface energy which appears as heat. Adsorption, therefore, is invariably an exothermic process, i.e., $\Delta H < 0$. When a gas is adsorbed, the freedom of movement of its molecules becomes restricted. This amounts to a decrease in the entropy of the gas after adsorption, i.e., $\Delta S < 0$ is negative.

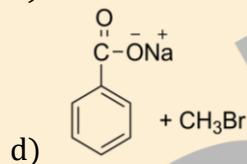
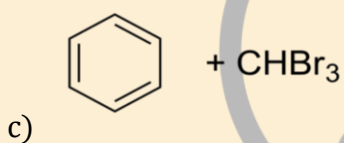
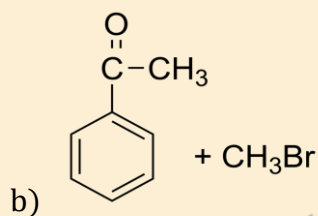
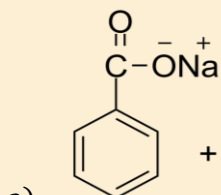
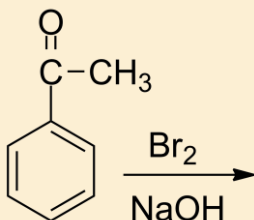
Hence, the correct option is a).

11. Find the product.

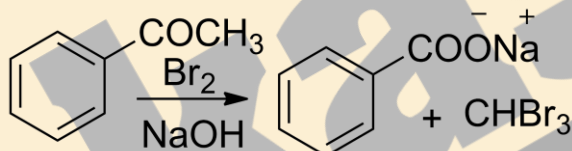
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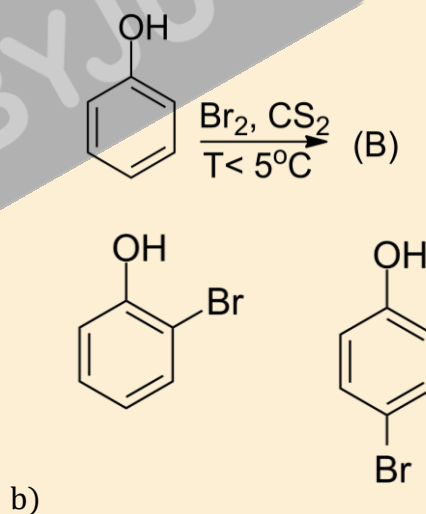
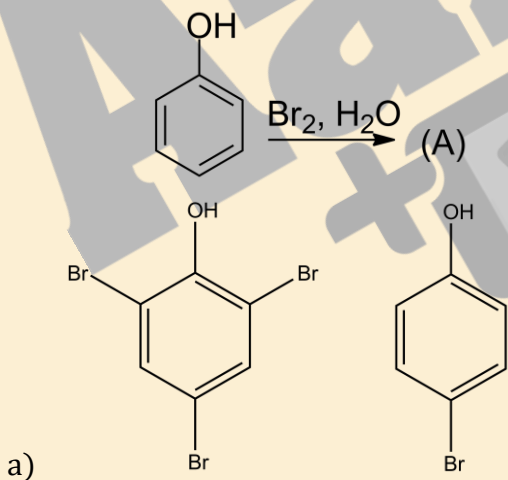
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Ans: a)
Solution



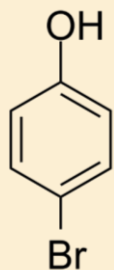
12. (A) and (B) respectively will be:



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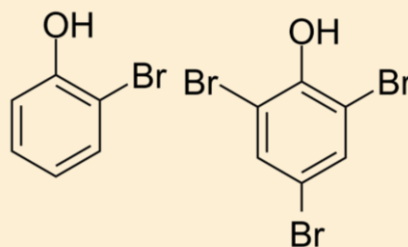
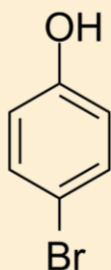


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c)

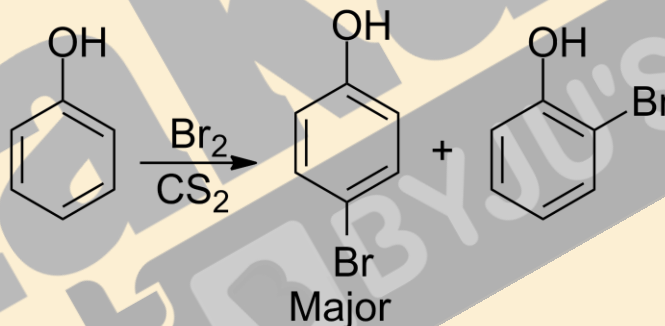
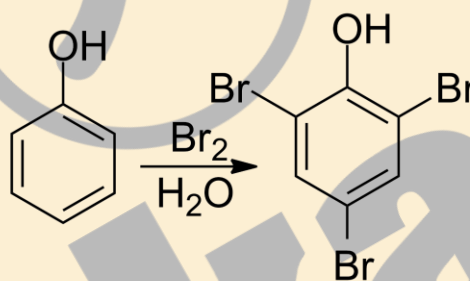
Ans: (a)



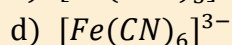
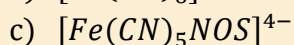
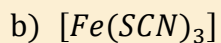
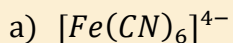
d)

Solution

In water, bromine is ionized to a greater extent and hence tribromination occurred. In carbondisulphide, bromine ionizes to a very less extent.



13. Choose the ion whose aqueous solution is violet colored?



Ans: (c)

Solution

Violet color is given by complex ion $[Fe(CN)_5NOS]^{4-}$. It is the test for detection of sulphur.

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d) i for $0.1\text{ M C}_6\text{H}_{12}\text{O}_6 = 1$

And i for ethanol ($\text{C}_2\text{H}_5\text{OH}$) = is also 1.

Hence, the correct answer will be d).

16. Which of the following will dissolve in water and give color?

a) Cu_2Cl_2

b) CuCl_2

c) AgBr

d) ZnCl_2

Ans: b) CuCl_2

Solution

CuCl_2 dissolves in water and gives colored solutions.

17. Statement I: In Bohr's model, velocity of electron increases with decrease in positive charge of nucleus as electrons are not held tightly.

Statement II: Velocity decreases with an increase in principal quantum number.

a) Statement I is correct & Statement II is correct

b) Statement I is correct & Statement II is incorrect

c) Statement I is incorrect & Statement II is incorrect

d) Statement I is incorrect & Statement II is correct

Ans: (d)

Solution

For Statement I:

According to the Bohr's model,

Velocity of electron,

$$V_n = v_o \frac{z}{n}$$

Where, $v_o = 2.18 \times 10^6\text{ m/s}$

So, with decrease in z , V_n will also decrease

Hence, Statement I is incorrect,

For Statement II:

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With increase in n , velocity will decrease as per the relation given above,

Hence, Statement II is correct

Hence, option d) is correct.

18. Correct sequence of U_{rms} of O_2, CO_2, N_2 at constant temperature.

a) $U_{N_2} > U_{O_2} > U_{CO_2}$

b) $U_{O_2} > U_{N_2} > U_{CO_2}$

c) $U_{CO_2} > U_{O_2} > U_{N_2}$

d) $U_{CO_2} = U_{O_2} = U_{N_2}$

Ans: a)

Solution

$$U_{rms} = \sqrt{\frac{3RT}{M}}$$

So, $U_{rms} \propto \frac{1}{\sqrt{M}}$ (At constant temperature)

And as we know, Molar Mass: $CO_2 > O_2 > N_2$

Therefore, $U_{rms} : U_{N_2} > U_{O_2} > U_{CO_2}$

Hence, option a) is correct.

19. Statement-I: Titration of strong acid with weak base uses methyl orange as an indicator.

Statement-II: Titration of weak acid with strong base uses phenolphthalein as an indicator.

a) Statement I is correct & Statement II is correct

b) Statement I is correct & Statement II is incorrect

c) Statement I is incorrect & Statement II is incorrect

d) Statement I is incorrect & Statement II is correct

Ans: a)

Solution

Statement I: Methyl Orange is suitable indicator for titration of strong acid and weak base is correct.

Statement II: Phenolphthalein is a suitable indicator for titration of weak acid and strong base is also correct.

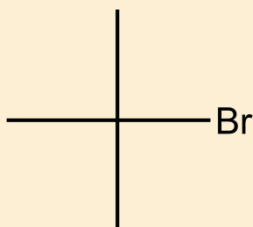
Hence, option a) is correct.

20. $Isobutane + Br_2(h\nu/temp = 125^{\circ}C) \rightarrow ?$

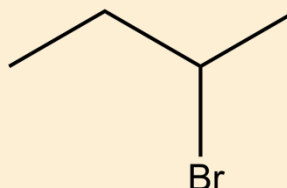
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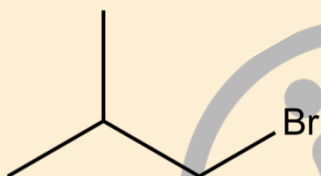
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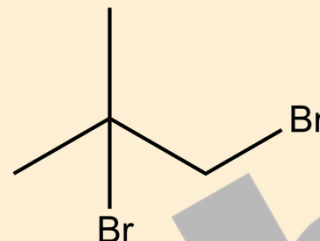
a)



c)

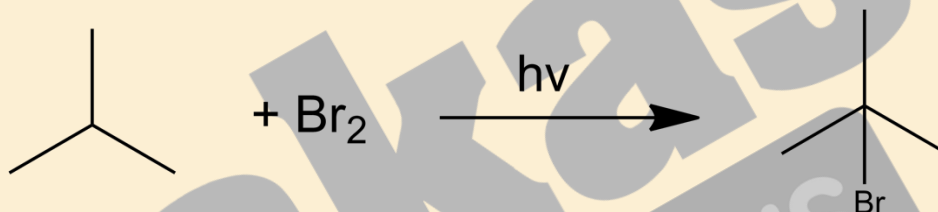


b)



d)

Ans: a
Solution

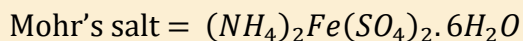
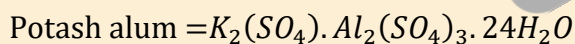


Bromination is highly selective.
Reactivity order is: $3^\circ > 2^\circ > 1^\circ$.

21. The ratio of water of crystallization present in Mohr's salt to that of Potash alum is $\times 10^{-1}$?

Ans: 2.5

Solution:



$$\text{Ratio of water molecule} = \frac{6 \text{ (From Mohr's Salt)}}{24 \text{ (From potash alum)}} = 0.25 = 2.5 \times 10^{-1}$$

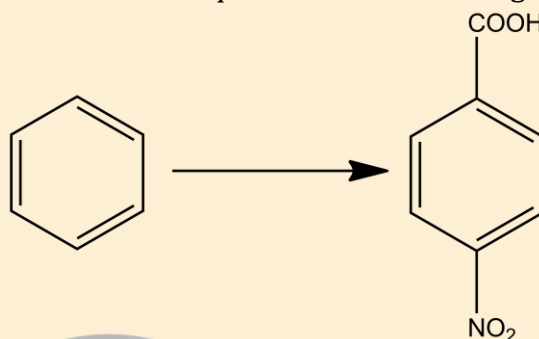
Hence, the correct answer is 2.5

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22. Which of the following is the correct sequence of the following conversion?



- a) $Br_2/FeBr_3, HNO_3/H_2SO_4, NaCN, H_2O/H^+$
- b) $HNO_3/H_2SO_4, Br_2/FeBr_3, Mg/Ether, CO_2, H_3O^+$
- c) $NaCN, H_3O^+, Br_2/FeBr_3, H_3O^+/CO_2/H_2O$
- d) $HNO_3/H_2SO_4, Br_2/FeBr_3/NaCN/H_2O$

Ans: a)

Solution:

