

JEE-Main-24-06-2022-Shift-1 (Memory Based)

Chemistry

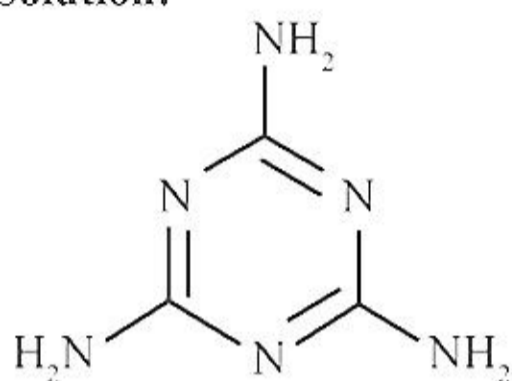
Question: Total Number of lone pair in Melamine

Options:

- (a) 6
- (b) 3
- (c) 2
- (d) 4

Answer: (a)

Solution:



Six lone pair

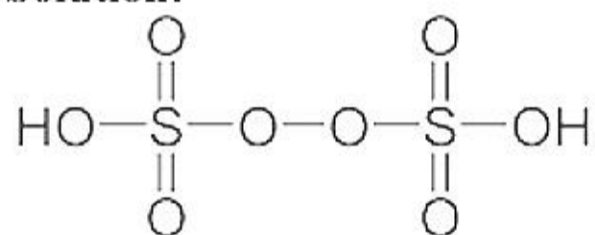
Question: Number of Pi bonds in Marshall's acid

Options:

- (a) 6
- (b) 3
- (c) 2
- (d) 4

Answer: (d)

Solution:



Question: Which of these is not a broad spectrum antibiotic?

Options:

- (a) Amoxicillin
- (b) Ofloxacin
- (c) Penicillin G
- (d) Chloramphenicol

Answer: (c)

Solution: Gram-positive or Gram-negative bacteria are narrow spectrum antibiotics. If effective against a single organism or disease, they are referred to as limited spectrum antibiotics. Penicillin G has a narrow spectrum. Ampicillin and Amoxycillin are synthetic

modifications of penicillin. These have broad spectrum. Chloramphenicol, isolated in 1947, is a broad spectrum antibiotic.

Question: Statement 1: Emulsion of water and oil is unstable and separates in two layers.
Statement 2: It is stabilized by added excess electrolytes.

Options:

- (a) Both S1 and S2 are correct.
- (b) S1 is correct but S2 is incorrect.
- (c) S1 is incorrect but S2 is correct.
- (d) Both S1 and S2 are incorrect.

Answer: (b)

Solution: Emulsions of oil in water are unstable and sometimes they separate into two layers on standing. For stabilization of an emulsion, a third component called emulsifying agent is usually added.

Question: $A(g) \rightleftharpoons B(g) + C/2(g)$

Find relationship between K_p , α , equilibrium pressure P .

Options:

(a) $K_p = \frac{\alpha^{\frac{3}{2}} P^{\frac{1}{2}}}{(2 + \alpha)^{\frac{1}{2}}}$

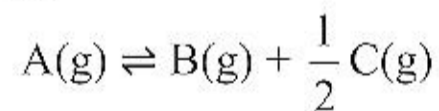
(b) $K_p = \frac{\alpha^{\frac{1}{2}} P^{\frac{1}{2}}}{(2 + \alpha)^{\frac{3}{2}}}$

(c) $K_p = \frac{\alpha^{\frac{1}{2}} P^{\frac{1}{2}}}{(2 + \alpha)^{\frac{3}{2}}}$

(d) $K_p = \frac{\alpha^{\frac{1}{2}} P^{\frac{3}{2}}}{(2 + \alpha)^{\frac{3}{2}}}$

Answer: (a)

Solution:



initial 1 0 0

final 1- α α $\frac{\alpha}{2}$

$$\text{Total mole} = 1 - \alpha + \alpha + \frac{\alpha}{2} = 1 + \frac{\alpha}{2}$$

$$x_A = \left(\frac{1 - \alpha}{1 + \frac{\alpha}{2}} \right)$$

$$x_B = \frac{\alpha}{1 + \frac{\alpha}{2}}$$

$$x_C = \frac{\alpha}{2 \left(1 + \frac{\alpha}{2}\right)}$$

$$K_p = \frac{P_B - P_C}{P_A}$$

Purity of the value we get the solution

$$K_p = \frac{\left(\frac{\alpha}{1 + \frac{\alpha}{2}}\right) P \cdot \left[\frac{\alpha}{2 \left(1 + \frac{\alpha}{2}\right)} P\right]^{\frac{1}{2}}}{\left(\frac{1 - \alpha}{1 + \frac{\alpha}{2}}\right) P}$$

$$K_p = \frac{\alpha \left(\frac{\alpha P}{2 \left(1 + \frac{\alpha}{2}\right)}\right)^{\frac{1}{2}}}{1 - \alpha}$$

$$K_p = \frac{\alpha^{\frac{3}{2}} P^{\frac{1}{2}}}{(2 + \alpha)^{\frac{1}{2}}}$$

Question: The molecule which has minimum role in photochemical smog

Options:

- (a) HCHO
- (b) N₂
- (c) NO
- (d) O₃

Answer: (b)

Solution: The common components of photochemical smog are ozone, nitric oxide, acrolein, formaldehyde and peroxyacetyl nitrate (PAN). Photochemical smog causes serious health problems. Both ozone and PAN act as powerful eye irritants. Ozone and nitric oxide irritate the nose and throat and their high concentration causes headache, chest pain, dryness of the throat, cough and difficulty in breathing.

Question: The difference between the oxidation number of Cr in chromate and dichromate ion is

Options:

- (a) 0
- (b) 1
- (c) 2

(d) 3

Answer: (a)

Solution: Oxidation number of Cr in chromate ion (CrO_4^{2-}) is +6
Oxidation number of Cr in dichromate ion ($\text{Cr}_2\text{O}_7^{2-}$) is also +6

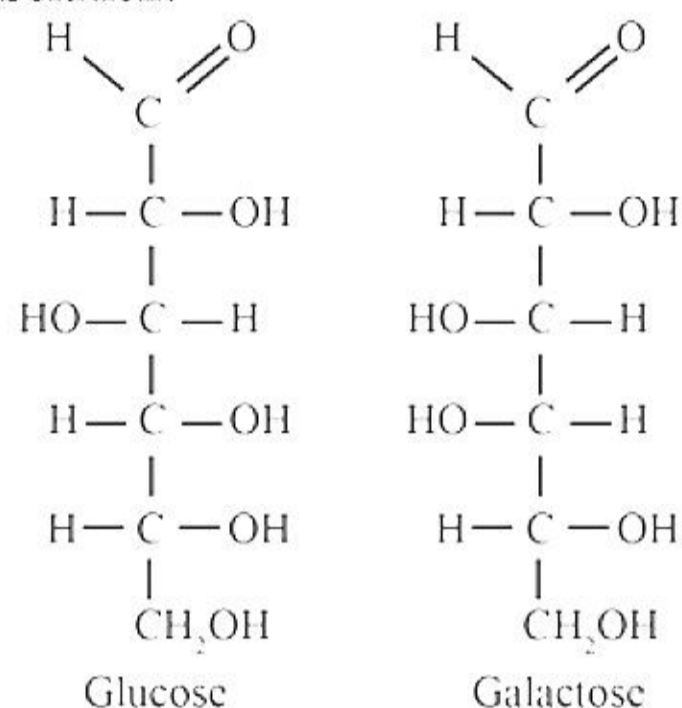
Question: Galactose is which epimer of Glucose

Options:

- (a) C-1
- (b) C-2
- (c) C-3
- (d) C-4

Answer: (d)

Solution:



Question: Which of the following is stable nitrogen halide?

Options:

- (a) NF_3
- (b) NCl_3
- (c) NBr_3
- (d) NI_3

Answer: (a)

Solution: Nitrogen is an element of second period and it cannot hold 3 larger halogen atoms efficiently, hence NF_3 is the only stable halide.

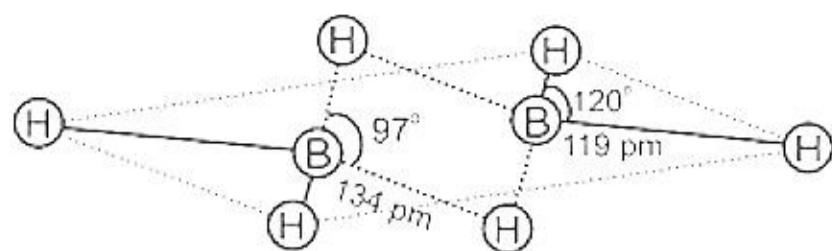
Question: Which of the following is correct statement?

Options:

- (a) B_2H_6 is Lewis Acid
- (b) All the B-H bonds in B_2H_6 are equal
- (c) B_2H_6 has planar structure
- (d) Maximum no. of hydrogen in one plane is six

Answer: (a)

Solution: The structure of diborane is shown in Fig. The four terminal hydrogen atoms and the two boron atoms lie in one plane. Above and below this plane, there are two bridging hydrogen atoms. The four terminal B-H bonds are regular two centre-two electron bonds while the two bridge (B-H-B) bonds are different and can be described in terms of three



Structure of diborane, B_2H_6

Question: Match the ore with its formula.

Column-I	Column-II
(A) Calamine	(P) PbS
(B) Galena	(Q) $ZnCO_3$
(C) Sphalerite	(R) $FeCO_3$
(D) Siderite	(S) ZnS

Options:

- (a) (A) \rightarrow (P); (B) \rightarrow (Q); (C) \rightarrow (R); (D) \rightarrow (S)
 (b) (A) \rightarrow (Q); (B) \rightarrow (P); (C) \rightarrow (R); (D) \rightarrow (S)
 (c) (A) \rightarrow (Q); (B) \rightarrow (P); (C) \rightarrow (R); (D) \rightarrow (S)
 (d) (A) \rightarrow (P); (B) \rightarrow (Q); (C) \rightarrow (S); (D) \rightarrow (R)

Answer: (c)

Solution:

Calamine $\rightarrow ZnCO_3$

Galena $\rightarrow PbS$

Sphalerite $\rightarrow ZnS$

Siderite $\rightarrow FeCO_3$

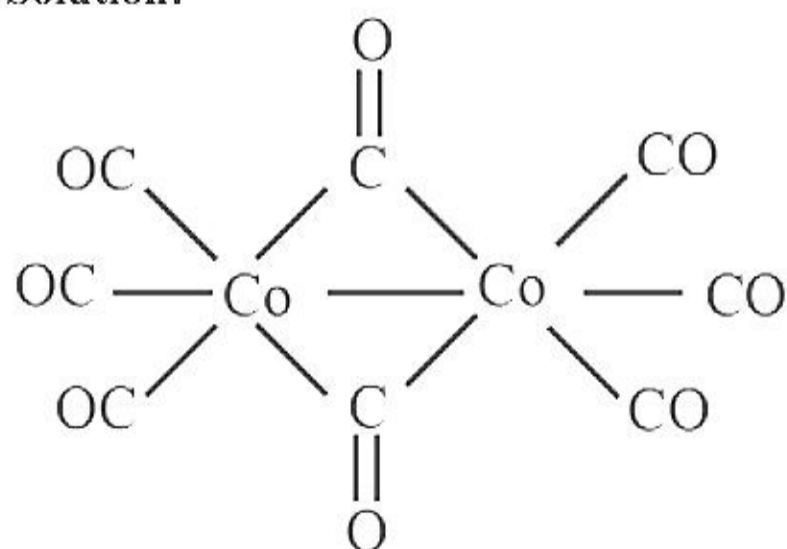
Question: In the structure of $[Co_2(CO)_8]$, x is the number of Co-Co bonds and y is the no of Co-CO terminal bonds. $x + y$?

Options:

- (a) 6
 (b) 8
 (c) 4
 (d) 7

Answer: (d)

Solution:

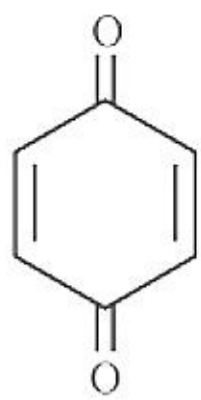


$x = 1$ and $y = 6$

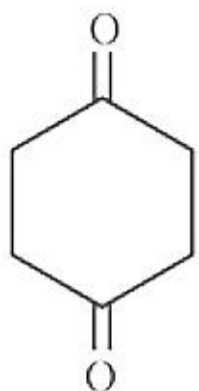
Question: Which is conjugate diene?

Options:

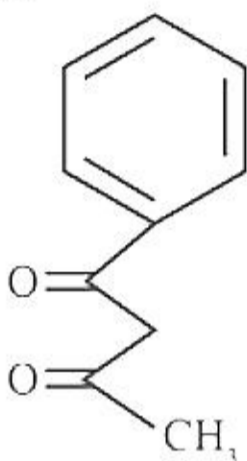
- (a)



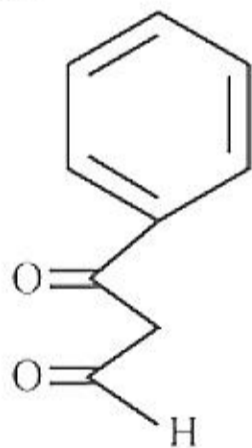
(b)



(c)

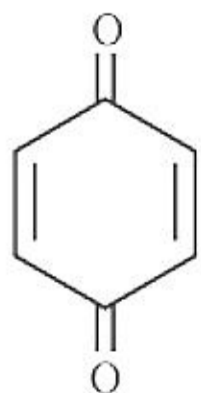


(d)



Answer: (a)

Solution:



It is a diketone with conjugation intact between both the functional groups.

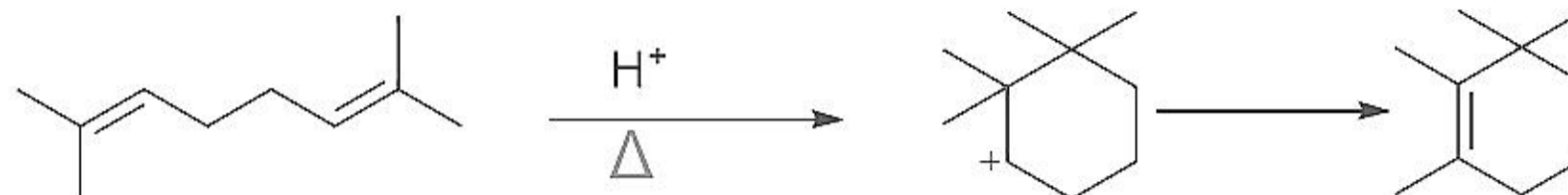
Question: 2, 7 - dimethyl - 2, 6 octadiene $\xrightarrow[\Delta]{H^+}$. Find the number of sp^2 hybridized carbon in the product 'A'?

Options:

- (a) 2
- (b) 4
- (c) 6
- (d) 5

Answer: (a)

Solution:



2, 7 - dimethyl - 2, 6 octadiene

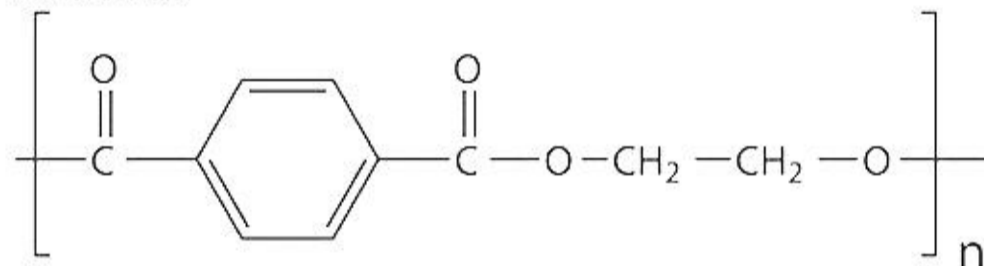
Question: Which of the following is a polyester?

Options:

- (a) Dacron
- (b) Polyethene
- (c) Teflon
- (d) DNA

Answer: (a)

Solution:



Question: Which of the following have the maximum melting point?

Options:

- (a) Acetic acid
- (b) Formic acid
- (c) Propanoic acid
- (d) Butanoic acid

Answer: (a)

Solution: Carboxylic acids with even number carbon atoms have higher melting point than those with odd number carbons atom. Among acetic acid and butanoic acid the latter molecules face more repulsion hence acetic acid has higher melting point.

Question: In the production of which of the following compound, H_2 is used?

Options:

- (a) CO_2
- (b) NH_3
- (c) P_4
- (d) SO_2

Answer: (b)

Solution: $N_2 + 3H_2 \rightleftharpoons 2NH_3$

Question: X is hcp, Y is $\frac{2}{3}$ of tetrahedral voids.... Find percentage of X in the lattice

Answer: 42.85

Solution: X is hcp

So atom per unit cell = 6

$$Y \text{ at } \frac{2}{3} \text{ of T-void} = \frac{2}{3} \times 12 = 8$$

$$\% \text{ of X} = \frac{6}{14} \times 100 = 42.85\%$$