

# JEE-Main-26-06-2022-Shift-2 (Memory Based)

## Chemistry

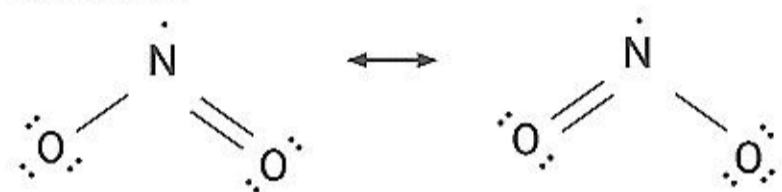
**Question:** Oxides of nitrogen having an odd electrons is

**Options:**

- (a)  $N_2O_5$
- (b)  $N_2O_3$
- (c)  $NO_2$
- (d)  $N_2O$

**Answer:** (c)

**Solution:**



**Question:**  $PhNO_2 + Sn/HCl \rightarrow A$

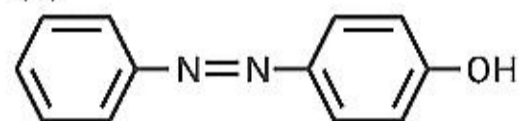
$A + NaNO_2/HCl \rightarrow B$

$B + \beta\text{-Naphthol} \rightarrow C$

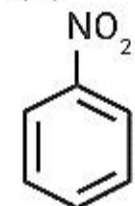
What is C ?

**Options:**

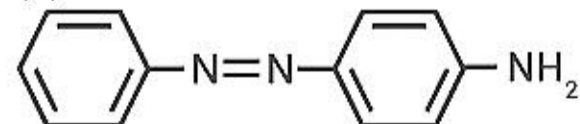
(a)



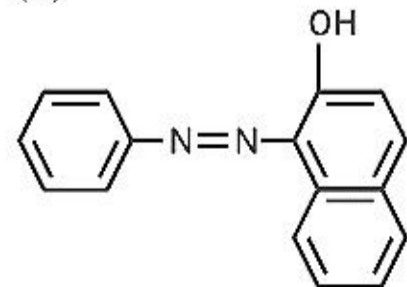
(b)



(c)

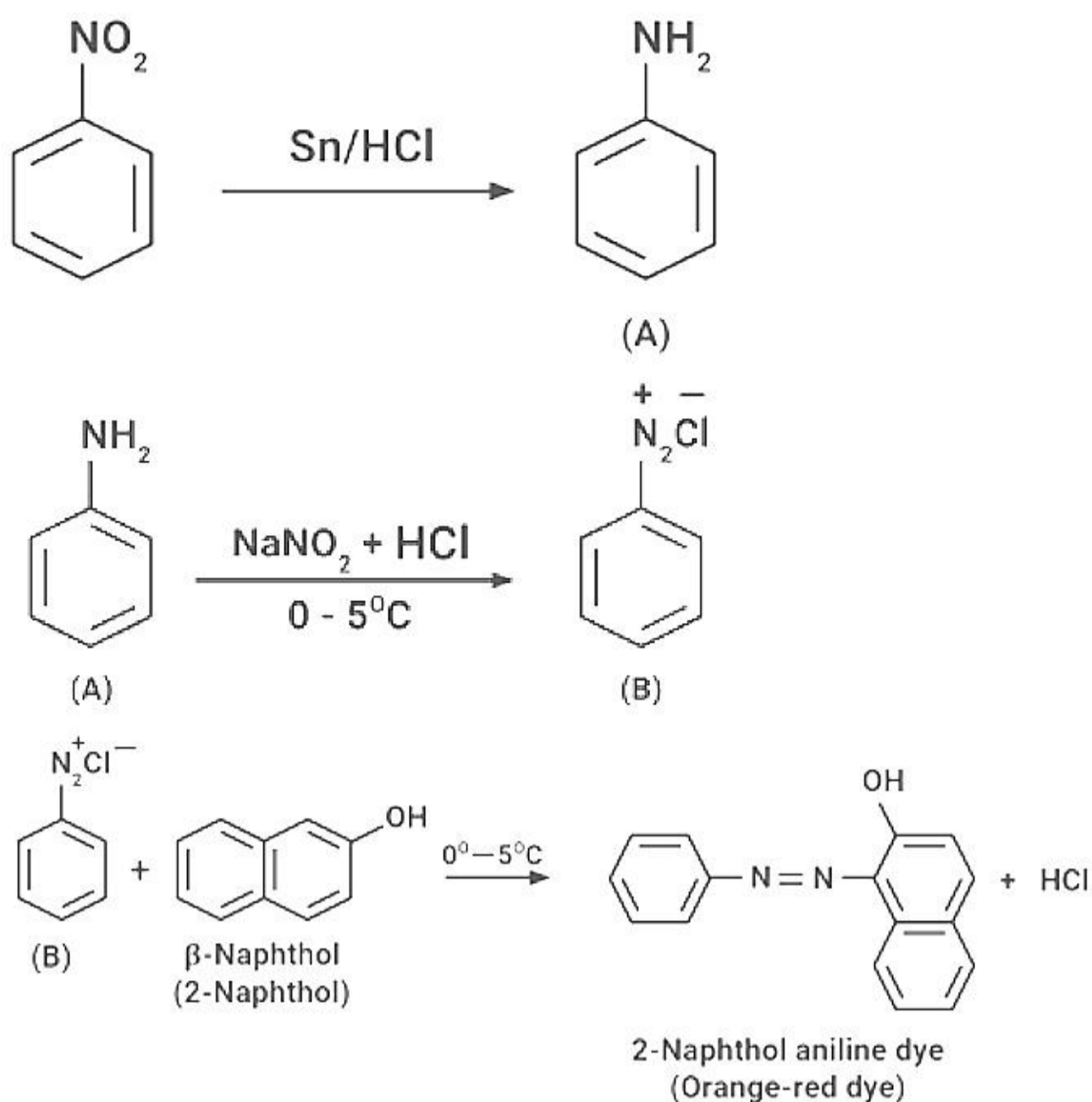


(d)



**Answer:** (d)

**Solution:**



**Question:** Identify the s-block element which do not give flame Test?

**Options:**

- (a) Na
- (b) K
- (c) Be
- (d) Ca

**Answer:** (c)

**Solution:** Be and Mg are the s-block elements that do not give flame test

**Question:** Which is not correct with respect to p-toluenesulphonylchloride?

**Options:**

- (a) It is Hinsberg's reagent
- (b) It forms a ppt which is soluble with alkali
- (c) Used to distinguish primary and secondary amines
- (d) Tertiary amines do not react with it

**Answer:** (b)

**Solution:** It forms a ppt which is soluble with alkali only in case of primary amines.

**Question:** Which of the following is a Metalloid?

**Options:**

- (a) Bi
- (b) Sc

(c) Te

(d) Hg

**Answer:** (c)

**Solution:** Bi, Hg and Sc are metals but Te is metalloid

**Question:** Which of the following is BOD value of polluted water?

**Options:**

(a) 4 ppm

(b) 17 ppm

(c) 8 ppm

(d) 5 ppm

**Answer:** (b)

**Solution:** Polluted water has BOD value  $> 10$  ppm

**Question:** Which one of the following does not usually show +3 Oxidation state?

**Options:**

(a) La

(b) Lu

(c) Ce

(d) Gd

**Answer:** (c)

**Solution:** Cerium shows +4 oxidation state as it obtains noble gas configuration.

**Question:** Which of the following water soluble vitamin cannot be excreted easily?

**Options:**

(a) B1

(b) B2

(c) B12

(d) B6

**Answer:** (c)

**Solution:** Water soluble vitamin must be supplied regularly in diet because they are readily excreted in urine and cannot be stored (except vitamin B<sub>12</sub>) in our body

**Question:** The correct order of nucleophilicity is

**Options:**

(a)  $\text{H}_2\text{O} > \text{OH}^-$

(b)  $\text{NH}_2^- > \text{NH}_3$

(c)  $\text{R-OH} > \text{RO}^-$

(d)  $\text{H-F} > \text{F}^-$

**Answer:** (b)

**Solution:** Conjugate anion of a species acts as a better nucleophile. Hence,  $\text{NH}_2^-$  is more nucleophilic than  $\text{NH}_3$

**Question:** A nucleus has 2 types of radioactive decays. The half life of first is 3 hours and for the second is 4.5 hours. Calculate the correct half life of nucleus.

**Options:**

- (a) 0.56 hours
- (b) 3.75 hours
- (c) 2.23 hours
- (d) 1.80 hours

**Answer:** (d)

**Solution:**

$$\lambda = \frac{0.693}{t_{1/2}}$$

$$\lambda = \lambda_1 + \lambda_2$$

$$\frac{1}{t_{1/2}} = \frac{1}{(t_{1/2})_1} + \frac{1}{(t_{1/2})_2} = \frac{1}{3} + \frac{1}{4.5} = \frac{7.5}{3 \times 4.5}$$

$$t_{1/2} = \frac{9}{5} = 1.8$$

**Question:** How many angular and radial nodes are in 4d orbital?

**Options:**

- (a) 1, 3
- (b) 1, 2
- (c) 2, 1
- (d) 1, 0

**Answer:** (c)

**Solution:**

Angular nodes =  $l$

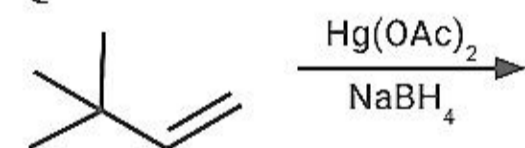
Radial nodes =  $n - l - 1$

For 4d,  $l = 2$  and  $n = 4$

Angular nodes = 2

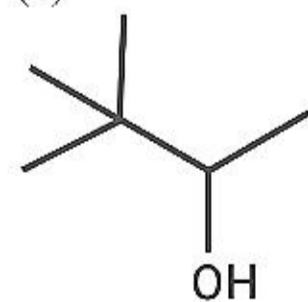
Radial nodes =  $4 - 2 - 1 = 1$

**Question:**

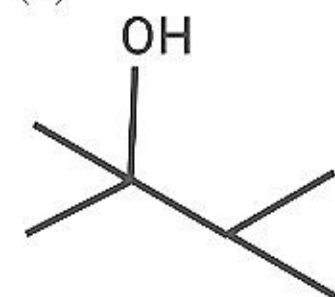


**Options:**

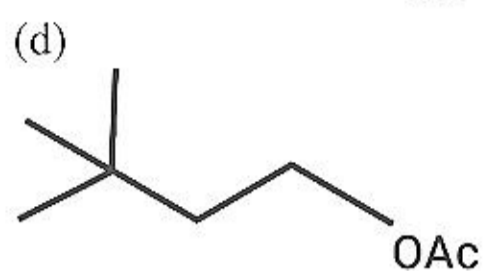
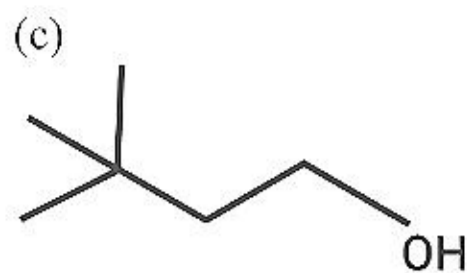
(a)



(b)

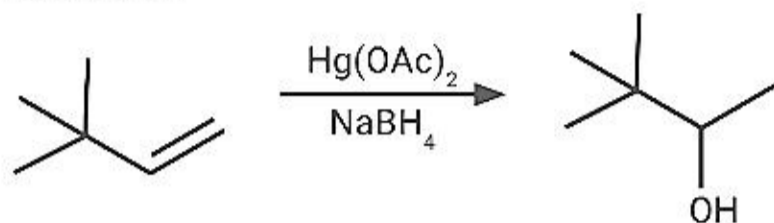






**Answer:** (a)

**Solution:**



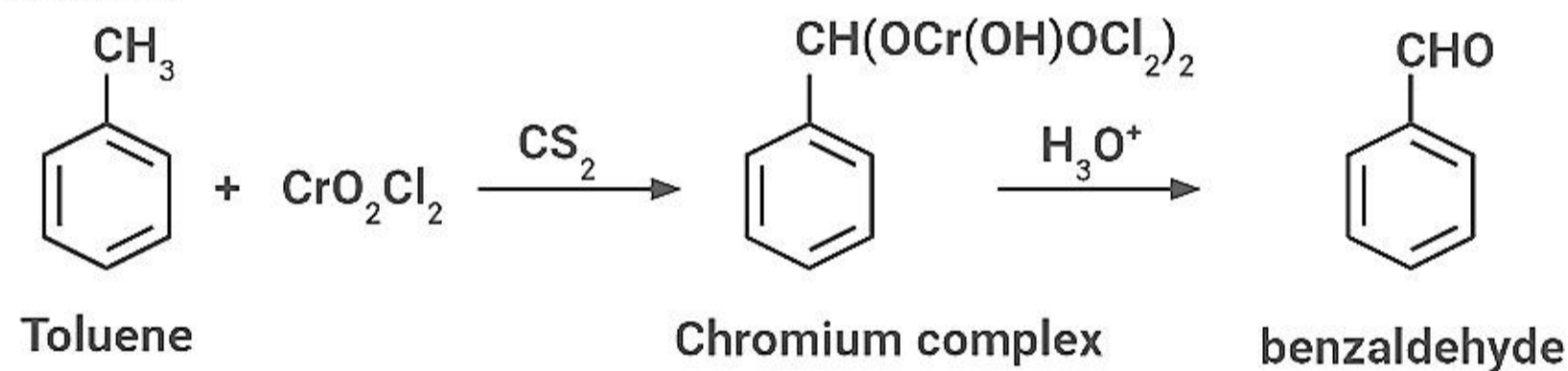
**Question:** Toluene can be easily converted into benzaldehyde by which of the following reagents?

**Options:**

- (a) CO, HCl, Anhyd.  $\text{AlCl}_3$
- (b) Acetic acid,  $\text{CS}_2$
- (c) (i)  $\text{CS}_2$  Chromyl chloride, (ii)  $\text{H}_3\text{O}^+$
- (d)  $\text{H}_2$ , Pd/ $\text{BaSO}_4$

**Answer:** (c)

**Solution:**



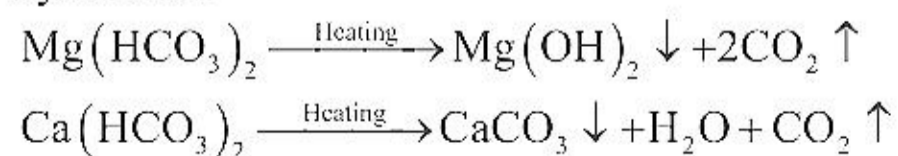
**Question:** Boiling of Hard water produces

**Options:**

- (a)  $\text{CaCO}_3$  and  $\text{Mg}(\text{OH})_2$
- (b)  $\text{Ca}(\text{OH})_2$  and  $\text{MgCO}_3$
- (c)  $\text{CaCO}_3$  and  $\text{MgCO}_3$
- (d)  $\text{Ca}(\text{OH})_2$  and  $\text{Mg}(\text{OH})_2$

**Answer:** (a)

**Solution:** Boiling of hard water causes the precipitation of calcium carbonate and magnesium hydroxide.



**Question:** Match the Following.

Enzyme	Function
I) Invertase	(A) Starch to maltose
II) Maltase	(B) Maltose to Glucose
III) Zymase	(C) Sugar to ethanol
IV) Diastase	(D) Inversion of Cane Sugar

**Options:**

- (a) I → D; II → B; III → C; IV → A  
 (b) I → A; II → B; III → C; IV → D  
 (c) I → D; II → C; III → B; IV → A  
 (d) I → C; II → B; III → A; IV → D

**Answer:** (a)

**Solution:**

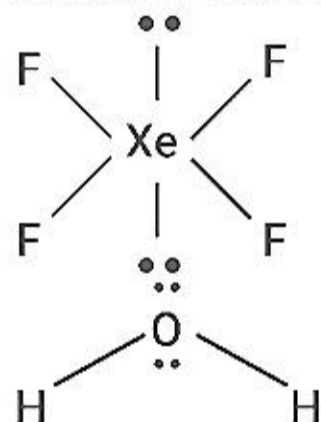
- I) Invertase ⇒ Inversion of Cane Sugar  
 II) Maltase ⇒ Maltose to Glucose  
 III) Zymase ⇒ Sugar to ethanol  
 IV) Diastase ⇒ Starch to maltose

**Question:** Number of molecules having two lone pairs on the central atom among the following is:

CH<sub>4</sub>, H<sub>2</sub>O, XeF<sub>4</sub>, SF<sub>4</sub>

**Answer:** 2.00

**Solution:** XeF<sub>4</sub> and H<sub>2</sub>O



**Question:** Number of electrons in t<sub>2g</sub> orbital of compound formed by reacting [Co(H<sub>2</sub>O)]<sup>2+</sup> with excess NH<sub>3</sub> in the presence of air is :

**Answer:** 6.00

**Solution:** [Co(H<sub>2</sub>O)<sub>6</sub>]<sup>2+</sup> + 6NH<sub>3</sub> → [Co(NH<sub>3</sub>)<sub>6</sub>]<sup>3+</sup> + 6H<sub>2</sub>O + e<sup>-</sup>

NH<sub>3</sub> with Co<sup>3+</sup> acts as a strong ligand.

Hence, all 6 electrons of Co will be present in t<sub>2g</sub> orbital.

**Question:** E<sub>cat</sub> - E<sub>uncat</sub> = 10, T = 300 K, preexponential factor is given. Find ratio of K<sub>cat</sub> to K<sub>uncat</sub>.

**Answer:** 1.00

**Solution:**

E<sub>cat</sub> - E<sub>uncat</sub> = 10, T = 300K

$$K = Ae^{-E_a/RT}$$

$$\frac{K_{\text{cat}}}{K_{\text{uncat}}} = e^{\frac{-(E_{a,\text{cat}} - E_{a,\text{uncat}})}{RT}}$$

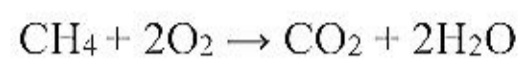
$$\frac{K_{\text{cat}}}{K_{\text{uncat}}} = e^{-\left(\frac{10}{8.314 \times 300}\right)} = e^{-\left(\frac{1}{249.42}\right)}$$

$$\frac{K_{\text{cat}}}{K_{\text{uncat}}} = 0.995 \approx 1$$

**Question:** 6.1 g of CNG is supplied with 208 g of oxygen. CO<sub>2</sub> and H<sub>2</sub>O is produced with a lot of heat. How much CO<sub>2</sub> is produced? [Consider CNG as methane]

**Answer:** 17.00

**Solution:**



6.1g    208 g

$$\text{No. of moles CH}_4 = \frac{6.1}{16} = 0.38$$

$$\text{No. of moles O}_2 = \frac{208}{32} = 6.5$$

CH<sub>4</sub> (CNG) is limiting reagent

0.38 moles CH<sub>4</sub> will produce 0.38 moles of CO<sub>2</sub>

$$\text{Amount of CO}_2 = 0.38 \times 44 = 16.72 \approx 17 \text{ g}$$