

# JEE-Main-29-07-2022-Shift-2 (Memory Based)

## Chemistry

**Question:** Which of the following is not a natural polymer?

**Options:**

- (a) Protein
- (b) Rayon
- (c) Starch
- (d) Rubber

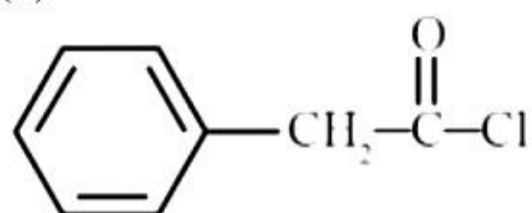
**Answer:** (b)

**Solution:** Rayon is a synthetic polymer.

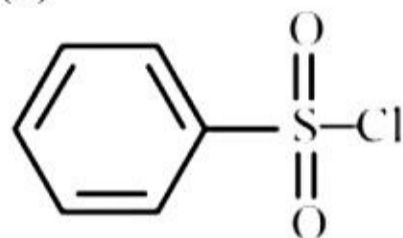
**Question:** Hinsberg's reagent is-

**Options:**

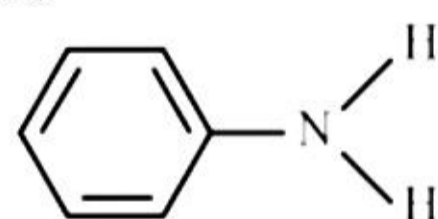
(a)



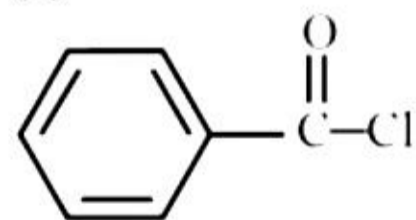
(b)



(c)

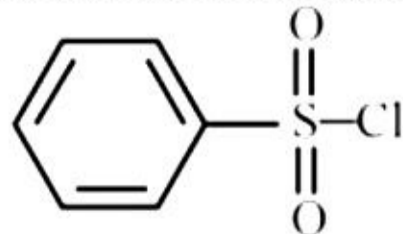


(d)



**Answer:** (b)

**Solution:** Hinsberg's reagent is benzenesulphonyl chloride



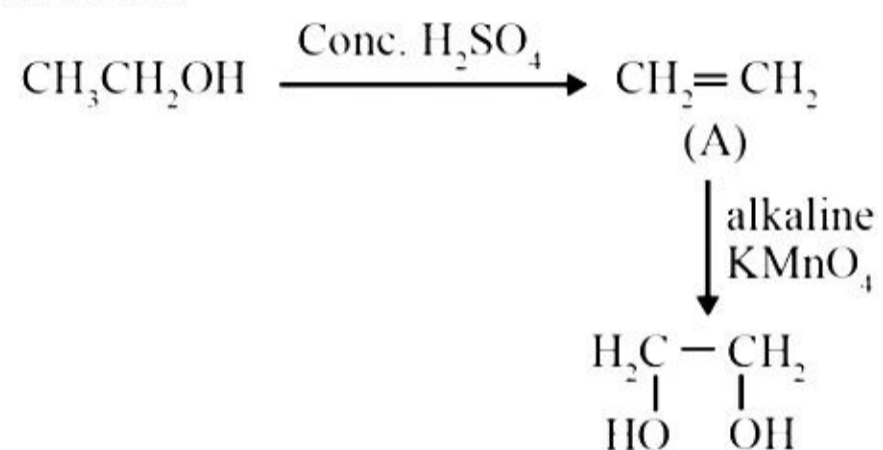
**Question:** In portland cement what enhances the setting time?

**Options:**

- (a)  $\text{CaSO}_4, \frac{1}{2}\text{H}_2\text{O}$
- (b)  $\text{CaSO}_4, 2\text{H}_2\text{O}$
- (c)  $\text{CaCO}_3$
- (d)  $\text{CaSO}_4$

**Answer:** (b)**Solution:** Gypsum ( $\text{CaSO}_4, 2\text{H}_2\text{O}$ ) is usually added to prevent early hardening and increase the setting time**Question:** Ethanol on reaction with conc.  $\text{H}_2\text{SO}_4$  gives A, which on further reaction with Baeyer's reagent will give:**Options:**

- (a) Ethane-1,2-diol
- (b) Formaldehyde
- (c) Formic acid
- (d) Ethanoic acid

**Answer:** (a)**Solution:****Question:** The sum of oxidation state (magnitude only) and coordination number of cobalt in  $\text{Na}[\text{Co}(\text{bpy})\text{Cl}_4]$ **Options:**

- (a) 3
- (b) 6
- (c) 9
- (d) 5

**Answer:** (c)**Solution:** Oxidation number =  $x - 4 + 1 = 0$ 

$$x = 3$$

Coordination number = 6

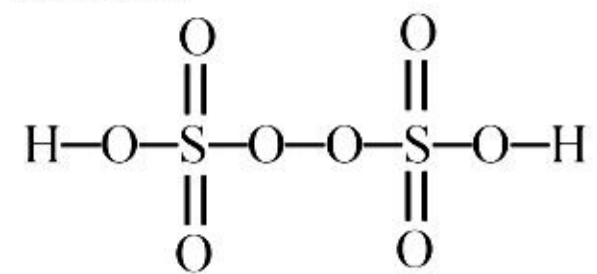
$$\text{Sum} = 3 + 6 = 9$$

**Question:** Which of the following compound has O–O linkage**Options:**

- (a)  $\text{H}_2\text{SO}_4$
- (b)  $\text{H}_2\text{S}_2\text{O}_8$
- (c)  $\text{H}_2\text{S}_2\text{O}_7$
- (d)  $\text{H}_2\text{SO}_3$

**Answer:** (b)

**Solution:**



**Question:** 200 ml of 0.01 M of HCl and 400 ml of 0.01 M of H<sub>2</sub>SO<sub>4</sub> are mixed. What is the final pH?

**Options:**

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

**Answer:** (a)

**Solution:**

$$[\text{H}^+] = \frac{2\text{mmol} + 8\text{mmol}}{600} = \frac{1}{60}$$

$$\text{pH} = -\log[\text{H}^+]$$

$$= -\log \frac{1}{60}$$

$$\text{pH} = 1.77 \approx 2$$

**Question:** Which of the following ions has lowest value of hydration enthalpy in magnitude?

**Options:**

- (a) Cr<sup>2+</sup>
- (b) Mn<sup>2+</sup>
- (c) Fe<sup>2+</sup>
- (d) Co<sup>2+</sup>

**Answer:** (b)

**Solution:** Hydration enthalpy order  $\text{Co}^{2+} > \text{Fe}^{2+} > \text{Cr}^{2+} > \text{Mn}^{2+}$

Therefore, Mn<sup>2+</sup> has largest hydration enthalpy

**Question:**  $\text{HNO}_3 + \text{KCl} \rightarrow \text{KNO}_3 + \text{Cl}_2 + \text{NOCl} + \text{H}_2\text{O}$ . Find amount of HNO<sub>3</sub> required to make 110 g KNO<sub>3</sub>

**Options:**

- (a) 91.5g
- (b) 56.4g
- (c) 14.7g
- (d) 67.2g

**Answer:** (a)

**Solution:**  $4\text{HNO}_3 + 3\text{KCl} \rightarrow 3\text{KNO}_3 + \text{Cl}_2 + \text{NOCl} + 2\text{H}_2\text{O}$

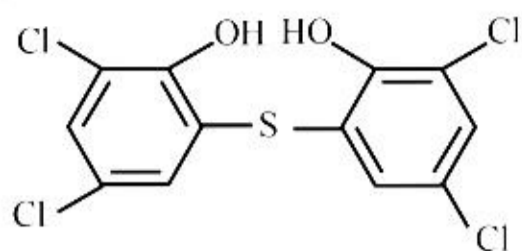
3 × 101 g of KNO<sub>3</sub> – 4 × 63 g of HNO<sub>3</sub>

$$110 \text{ g of KNO}_3 - \frac{4 \times 63 \times 110}{3 \times 101} = 91.5 \text{ g}$$

**Question:** Number of chlorine atoms in Bithionol is

**Answer:** 4.00

**Solution:**



**Question:** How many among the following are  $sp^3d^2$  hybridised?

$BrF_5$ ,  $[ICl_4]^-$ ,  $ICl_3$ ,  $ICl_5$ ,  $SF_6$ ,  $PCl_5$

**Answer:** 4.00

**Solution:**

$$BrF_5 = \frac{1}{2}(7 + 5) = 6 = sp^3d^2$$

$$[ICl_4]^- = \frac{1}{2}(7 + 4 + 1) = 6 = sp^3d^2$$

$$ICl_5 = \frac{1}{2}(7 + 5) = 6 = sp^3d^2$$

$$SF_6 = \frac{1}{2}(6 + 6) = 6 = sp^3d^2$$

**Question:** Weight of  $O_2$  is x gram and for Ne is 200 g. Total pressure is 25 bar and Partial pressure of Ne 20 bar Find x =?

**Answer:** 80.00

**Solution:**

$$P_{Ne} = x_{Ne} P_{total}$$

$$x_{Ne} = \frac{20}{25} = \frac{4}{5}$$

$$x_{Ne} = \frac{\frac{200}{20}}{\frac{200}{20} + \frac{x}{32}} = \frac{4}{5}$$

$$\frac{10}{10 + \frac{x}{32}} = \frac{4}{5}$$

$$50 = 40 + \frac{x}{8}$$

$$x = 80 \text{ g}$$