

हमारा विश्वास... हर एक विद्यार्थी है खास

**JEE
MAIN
April'19**

PAPER WITH SOLUTION
12 April 2019 _ Evening _ Chemistry

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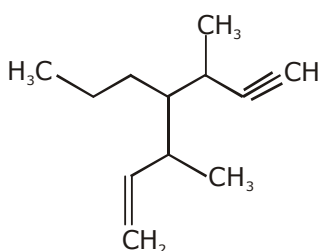
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1. The correct statement is:
 (1) leaching of bauxite using concentrated NaOH solution gives sodium aluminate and sodium silicate
 (2) pig iron is obtained from cast iron
 (3) the blistered appearance of copper during the metallurgical process is due to the evolution of CO_2
 (4) the Hall-Heroult process is used for the production of aluminium and iron

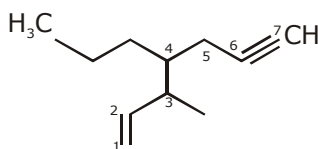
Sol. 1
Conceptual

2. The IUPAC name for the following compound is:



- (1) 3-methyl-4-(1-methylprop-1-ynyl)-1-heptene
 (2) 3,5-dimethyl-4-propylhept-1-en-6-yne
 (3) 3-methyl-4-(3-methylprop-1-enyl)-1-heptyne
 (4) 3,5-dimethyl-4-propylhept-6-en-1-yne

Sol. 2



3, 5-dimethyl-4-propylhept-1-en-6yne

3. An 'Assertion' and a 'Reason' are given below. Choose the correct answer from the following options :

Assertion (A): Vinyl halides do not undergo nucleophilic substitution easily.

Reason (R) : Even though the intermediate carbocation is stabilized by loosely held π -electrons, the cleavage is difficult because of strong bonding.

Both (A) and (R) are correct

(1) Statements and (R) is the correct explanation of (A).

Both (A) and (R) are wrong statements.

(2) Statements but (R) is not the correct explanation of (A).

Both (A) and (R) are wrong

(3) Statements.

(4) (A) is a correct statement but (R) is a wrong statement.

Sol. 4

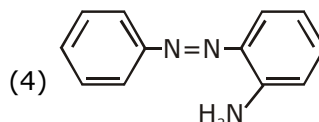
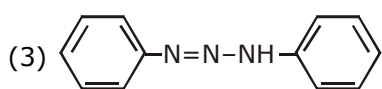
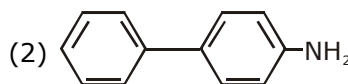
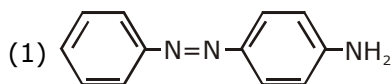
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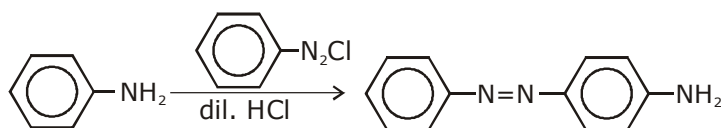
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4. Benzene diazonium chloride on reaction with aniline in the presence of dilute hydrochloric acid gives :



Sol. 1



5. The pair that has similar atomic radii is :

(1) Ti and Hf (2) Sc and Ni (3) Mn and Re (4) Mo and W

Sol. 4

Mo and W has similar atomic radii due to lanthanamide contraction.

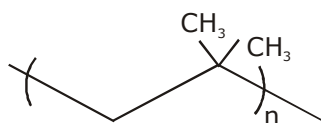
6. Among the following, the INCORRECT statement about colloids is :

(1) They are larger than small molecules and have high molar mass.
 (2) The osmotic pressure of a colloidal solution is of higher order than the true solution at the same concentration.
 (3) They can scatter light.
 (4) The range of diameters of colloidal particles is between 1 and 1000 nm.

Sol. 2

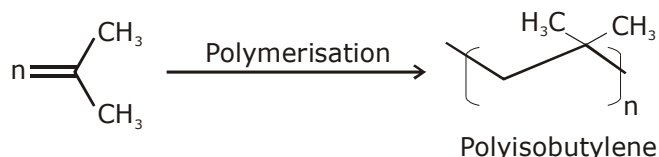
Colloidal solution shows low osmotic pressure w/t true solution as no of particles of colloidal solution are low due to high molar mass.

7. The correct name of the following polymer is :



(1) Polyisoprene
 (2) Polytert-butylene
 (3) Polyisobutane
 (4) Polyisobutylene

Sol. 4



Fee ₹ 1500

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8. NO_2 required for a reaction is produced by the decomposition of N_2O_5
 $2\text{N}_2\text{O}_5(\text{g}) \rightarrow 4\text{NO}_2(\text{g}) + \text{O}_2(\text{g})$
 The initial concentration of N_2O_5 is 3.00 mol L^{-1} and it is 2.75 mol L^{-1} after 30 minutes. The rate of formation of NO_2 is :
 (1) $4.167 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$
 (2) $8.333 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$
 (3) $1.667 \times 10^{-2} \text{ mol L}^{-1} \text{ min}^{-1}$
 (4) $2.083 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$

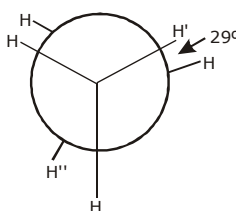
Sol. 3

$$r = -\frac{1}{2} \frac{d[\text{N}_2\text{O}_5]}{dt} = \frac{1}{4} \frac{d[\text{NO}_2]}{dt}$$

$$\therefore \frac{(2.75 - 3)}{2 \times 30} \times 4 = \frac{d[\text{NO}_2]}{dt}$$

$$\Rightarrow \frac{d[\text{NO}_2]}{dt} = 1.6 \times 10^{-2} \frac{\text{mol}}{\text{lt min}}$$

9. In the following skew conformation of ethane, $\text{H}' - \text{C} - \text{C} \text{H}'$ dihedral angle is :



- (1) 58° (2) 120° (3) 149° (4) 151°

Sol. 3
conceptual

10. Heating of 2-chloro-1-phenylbutane with EtOK/EtOH gives X as the major product. Reaction of X with $\text{Hg}(\text{OAc})_2/\text{H}_2\text{O}$ followed by NaBH_4 gives Y as the major product. Y is :

- (1)
- (2)
- (3)
- (4)

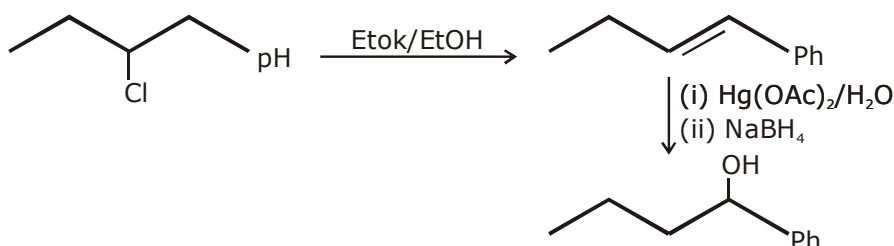
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Sol. 1



- 11.** In comparison to boron, beryllium has :
- (1) lesser nuclear charge and greater first ionisation enthalpy.
 - (2) lesser nuclear charge and lesser first ionisation enthalpy.
 - (3) Greater nuclear charge and lesser first ionisation enthalpy.
 - (4) Greater nuclear charge and Greater first ionisation enthalpy.

Sol. 1

Be $2s^2$ full filled electronic configuration

- 12.** In which one of the following equilibria, $K_p \neq K_c$?
- (1) $2 \text{NO(g)} \longrightarrow \text{N}_2\text{(g)} + \text{O}_2\text{(g)}$
 - (2) $\text{NO}_2\text{(g)} + \text{SO}_2\text{(g)} \longrightarrow \text{NO(g)} + \text{SO}_3\text{(g)}$
 - (3) $2 \text{C(s)} + \text{O}_2\text{(g)} \longrightarrow 2 \text{CO(g)}$
 - (4) $2 \text{HI(g)} \longrightarrow \text{H}_2\text{(g)} + \text{I}_2\text{(g)}$

Sol. 3

$\Delta n_g = 1$ not zero.

- 13.** The C – C bond length is maximum in :
- (1) Graphite
 - (2) C_{70}
 - (3) C_{60}
 - (4) diamond

Sol. 4

has multiple bond in resonance white test other has single carbon bond carbon bond diamond has strong C–C bond

- 14.** The ratio of number of atoms present in a simple cubic, body centered cubic and face centered cubic structure are, respectively :
- (1) 4 : 2 : 1
 - (2) 4 : 2 : 3
 - (3) 8 : 1 : 6
 - (4) 1 : 2 : 4

Sol. 4

Simple cubic	:	bcc	:	fcc
Z = 1		2		4

- 15.** The primary pollutant that leads to photochemical smog is :
- (1) Sulphur dioxide
 - (2) nitrogen oxides
 - (3) acrolein
 - (4) ozone

Sol. 2

Nitrogen oxides are primary pollutants that leads to photochemical smog.

- 16.** The compound used in the treatment of lead poisoning is :
- (1) desferrioxime B
 - (2) Cis-platin
 - (3) EDTA
 - (4) D-penicillamine

Sol. 3

factual

Fee ₹ 1500

JEE ADVANCED TEST SERIES

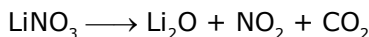
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17. The INCORRECT statement is :

- (1) LiCl crystallises from aqueous solution as $\text{LiCl} \cdot 2\text{H}_2\text{O}$.
- (2) Lithium is least reactive with water among the alkali metals.
- (3) Lithium is the strongest reducing agent among the alkali metals.
- (4) LiNO_3 decomposes on heating to give LiNO_2 and O_2 .

Sol. 4



18. Which of the given statements is INCORRECT about glycogen ?

- (1) It is present in some yeast and fungi.
- (2) It is present in animal cells.
- (3) It is a straight chain polymer similar to amylose.
- (4) Only α -linkages are present in the molecule.

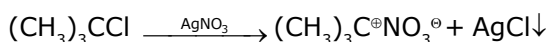
Sol. 3

Glycogen is branched chain polymers similar to amylopectin

19. Which one of the following is likely to give a precipitate with AgNO_3 Solution ?

- (1) CCl_4
- (2) $(\text{CH}_3)_3\text{CCl}$
- (3) CHCl_3
- (4) $\text{CH}_2 = \text{CH} - \text{Cl}$

Sol. 2



20. The decreasing order of electrical conductivity of the following aqueous solutions is :

- 0.1 M Formic acid (A),
- 0.1 M Acetic acid (B),
- 0.1 M Benzoic acid (C).

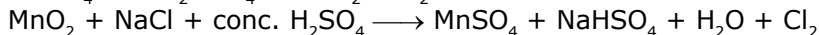
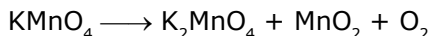
- (1) $A > C > B$
- (2) $C > A > B$
- (3) $A > B > C$
- (4) $C > B > A$

Sol. 4

21. Thermal decomposition of a Mn compound (X) at 513 K results in compound Y, MnO_2 and a gaseous product. MnO_2 reacts with NaCl and concentrated H_2SO_4 to give a pungent gas Z. X, Y, and Z, respectively, are :

- (1) K_2MnO_4 , KMnO_4 and Cl_2
- (2) KMnO_4 , K_2MnO_4 and Cl_2
- (3) K_2MnO_4 , KMnO_4 and SO_2
- (4) K_3MnO_4 , K_2MnO_4 and Cl_2

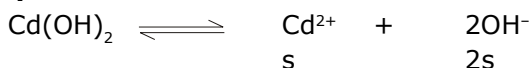
Sol. 2



22. The molar solubility of $\text{Cd}(\text{OH})_2$ is 1.84×10^{-5} M in water. The Expected solubility of $\text{Cd}(\text{OH})_2$ in a buffer solution of $\text{pH} = 12$ is :

- (1) 6.23×10^{-11} M
- (2) 1.84×10^{-9} M
- (3) $\frac{2.49}{1.84} \times 10^{-9}$ M
- (4) 2.49×10^{-10} M

Sol. 4



$$K_{sp} = 4 \times s^3 = 4 \times (1.84 \times 10^{-5})^3$$

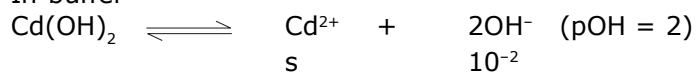
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In buffer



$$\therefore K_{sp} = s \times (10^{-2})^2$$

$$\Rightarrow 4 \times (1.84 \times 10^{-5})^3 = s \times 10^{-4}$$

$$\Rightarrow s = 2.49 \times 10^{-10} \text{ mol/lit}$$

- 23.** A solution is prepared by dissolving 0.6 g of urea (molar mass = 60 g mol⁻¹) and 1.8 g of glucose (molar mass = 180 g mol⁻¹) in 100 mL of water at 27 °C. The osmotic pressure of the solution is :

$$(R = 0.08206 \text{ L atm K}^{-1} \text{ mol}^{-1})$$

- (1) 8.2 atm (2) 4.92 atm (3) 1.64 atm (4) 2.46 atm

Sol. 2

$$\pi = \pi_1 + \pi_2$$

$$= \left(\frac{0.6}{60 \times 100} \times 1000 + \frac{1.8}{180 \times 100} \times 1000 \right) 0.08206 \times 300$$

$$= (0.1 + 0.1) \times 0.08206 \times 300$$

$$= 4.92 \text{ atm}$$

- 24.** The INCORRECT match in the following is :

- (1) $\Delta G^\circ < 0$, $K < 1$ (2) $\Delta G^\circ > 0$, $K < 1$ (3) $\Delta G^\circ < 0$, $K > 1$ (4) $\Delta G^\circ = 0$, $K = 1$

Sol. 1

$$\Delta G^\circ = -RT \ln K$$

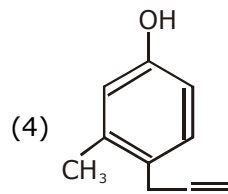
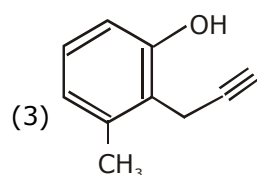
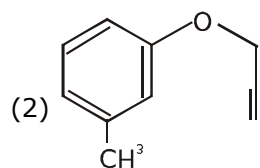
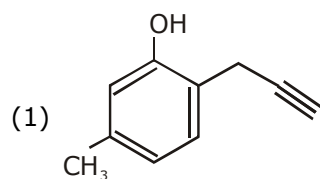
- 25.** Among the following, the energy of 2s orbital is lowest in :

- (1) Li (2) K (3) H (4) Na

Sol. 2

Conceptual

- 26.** What will be major product when m-cresol is reacted with propargyl bromide ($\text{HC} \equiv \text{C}-\text{CH}_2\text{Br}$) in presence of K_2CO_3 in acetone ?



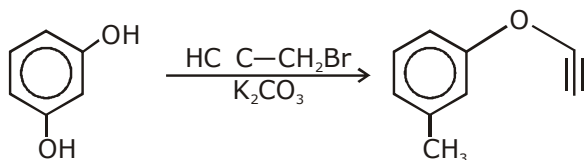
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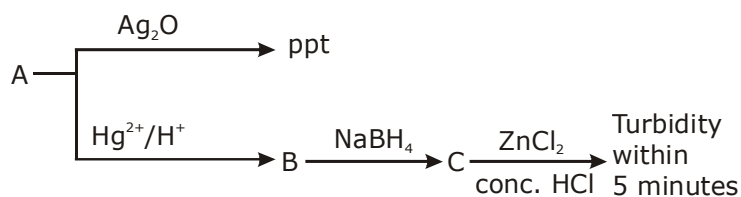
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Sol. 2



27. Consider the following reactions :



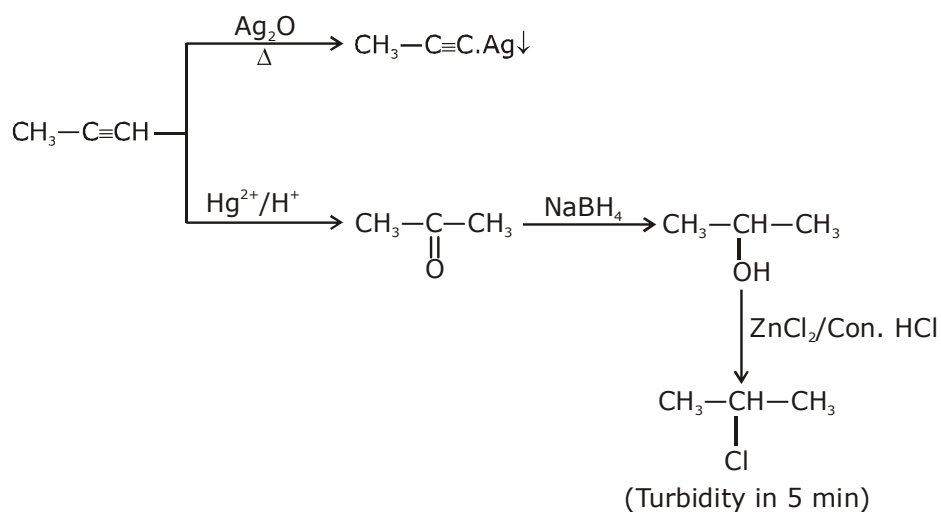
(1) $\text{CH}\equiv\text{CH}$

(2) $\text{CH}_2=\text{CH}_2$

(3) $\text{CH}_3-\text{C}\equiv\text{C}-\text{CH}_3$

(4) $\text{CH}_3-\text{C}\equiv\text{CH}$

Sol. 4



28. 25 g of an unknown hydrocarbon upon burning produces 88 g of CO_2 and 9 g of H_2O . This unknown hydrocarbon contains :

- (1) 20 g of carbon and 5 g of hydrogen
- (2) 22 g of carbon and 3 g of hydrogen
- (3) 24 g of carbon and 1 g of hydrogen
- (4) 18 g of carbon and 7 g of hydrogen

Fee ₹ 1500

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Sol. 3

C : H

$$n = \frac{88}{44} : \frac{9 \times 2}{18}$$

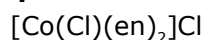
$$n = 2 : 1$$

$$\therefore w = 24 : 1$$

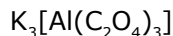
29. The coordination numbers of Co and Al in $[\text{Co}(\text{Cl})(\text{en})_2]\text{Cl}$ and $\text{K}_3[\text{Al}(\text{C}_2\text{O}_4)_3]$, respectively, are :
(en = ethane -1,2-diamine)

- (1) 3 and 3 (2) 5 and 3 (3) 6 and 6 (4) 5 and 6

Sol. 4



C.NO. of Co = 5

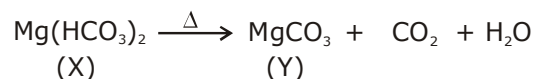


C. NO. of Al = 6

30. The temporary hardness of a water sample is due to compound X. Boiling this sample converts X to compound Y, X and Y, respectively, are :

- (1) $\text{Ca}(\text{HCO}_3)_2$ and $\text{Ca}(\text{OH})_2$
(2) $\text{Mg}(\text{HCO}_3)_2$ and $\text{Mg}(\text{OH})_2$
(3) $\text{Ca}(\text{HCO}_3)_2$ and Cao
(4) $\text{Mg}(\text{HCO}_3)_2$ and MgCO_3

Sol. 4



Fee ₹ 1500

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मोशन ने बनाया साधारण को असाधारण

JEE Main Result Jan'19

4 RESIDENTIAL COACHING PROGRAM (DRONA) STUDENTS ABOVE 99.9 PERCENTILE

 <p>99.9 percentile PHYSICS 100 percentile Nitin Gupta</p> <p>Exp. Score 335 Last yr Score 149</p>	 <p>99.9 percentile Shiv Modi</p> <p>Exp. Score 318 Last yr Score 153</p>	 <p>99.9 percentile Ritik Bansal</p> <p>Exp. Score 308 Last yr Score 218</p>	 <p>99.9 percentile Shubham Kumar</p> <p>Exp. Score 300 Last yr Score 153</p>
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Total Students Above 99.9 percentile - **17**

Total Students Above 99 percentile - **282**

Total Students Above 95 percentile - **983**

% of Students Above 95 percentile $\frac{983}{3538} = \mathbf{27.78\%}$

Scholarship on the Basis of 12th Class Result

Marks PCM or PCB	Hindi State Board	State Eng OR CBSE
70%-74%	30%	20%
75%-79%	35%	25%
80%-84%	40%	35%
85%-87%	50%	40%
88%-90%	60%	55%
91%-92%	70%	65%
93%-94%	80%	75%
95% & Above	90%	85%

New Batches for Class 11th to 12th pass
17 April 2019 & 01 May 2019

हिन्दी माध्यम के लिए प्रत्येक बैच

Scholarship on the Basis of JEE Main Percentile

Score	JEE Mains Percentile	English Medium Scholarship	Hindi Medium Scholarship
225 Above	Above 99	Drona Free (Limited Seats)	
190 to 224	Above 97.5 To 99	100%	100%
180 to 190	Above 97 To 97.5	90%	90%
170 to 179	Above 96.5 To 97	80%	80%
160 to 169	Above 96 To 96.5	60%	60%
140 to 159	Above 95.5 To 96	55%	55%
74 to 139	Above 95 To 95.5	50%	50%
66 to 73	Above 93 To 95	40%	40%
50 to 65	Above 90 To 93	30%	35%
35 to 49	Above 85 To 90	25%	30%
20 to 34	Above 80 To 85	20%	25%
15 to 19	75 To 80	10%	15%

सैन्य कर्मियों के बच्चों के लिए **50%** छात्रवृत्ति

प्री-मेडिकल में छात्राओं को **50%** छात्रवृत्ति