### CBSE Class 12 Chemistry Question Paper 2020
**Solution Set 2**

**CHEMISTRY STANDARD SOLVED**
**SET 2 (CODE: 30/5/2)**

<table>
<thead>
<tr>
<th>Q. NO</th>
<th>SOLUTION</th>
<th>TOTAL MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Organic compounds with (-NH_2) and COOH group are known as amino acids</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Due to the formation of zwitter ion</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>Acidic amino acids have more (-COOH) groups and basic amino acids have more (NH_2) groups</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>These are not synthesized by body to be supplied in diet.</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>Peptide linkage</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>Vapour phase refining.</td>
<td>1</td>
</tr>
<tr>
<td>7.</td>
<td>Desorption</td>
<td>1</td>
</tr>
<tr>
<td>8.</td>
<td>Zinc</td>
<td>1</td>
</tr>
<tr>
<td>9.</td>
<td>Linkage and ionisation isomerism</td>
<td>1</td>
</tr>
<tr>
<td>10.</td>
<td>Order is two</td>
<td>1</td>
</tr>
<tr>
<td>11.</td>
<td>(C) 2-Methyl bhutan-2-ol</td>
<td>1</td>
</tr>
<tr>
<td>12.</td>
<td>(D) 2.0 M</td>
<td>1</td>
</tr>
<tr>
<td>13.</td>
<td>(A) reduced form is more stable compared to hydrogen gas.</td>
<td>1</td>
</tr>
<tr>
<td>14.</td>
<td>(D) 5</td>
<td>1</td>
</tr>
<tr>
<td>15.</td>
<td>(A) They are chemically reactive</td>
<td>1</td>
</tr>
<tr>
<td>16.</td>
<td>(i) Both assertion (A) and reason (R) are correct statements, and reason (R) is the correct explanation of the assertion (A).</td>
<td>1</td>
</tr>
<tr>
<td>17.</td>
<td>(iii) Assertion (A) is correct, but reason (R) is incorrect statement.</td>
<td>1</td>
</tr>
</tbody>
</table>
18. (i) Both assertion (A) and reason (R) are correct statements, and reason (R) is the correct explanation of the assertion (A). 1

19. (i) Both assertion (A) and reason (R) are correct statements, and reason (R) is the correct explanation of the assertion (A). 1

20. (iii) Assertion (A) is correct, but reason (R) is incorrect statement. 1

SECTION – B

21. a) Due to intermolecular H-bonding in alcohol 2
   b) Due to resonance C = O is attained in phenol 2

22. Tranquilizers reduces the mental stress and acts as a part of anti depressants 2
    Eg: Barbituaric acid derivatives
    Analgesics: These are pain killers
    Eg: Aspirin
    b) Antiseptics reduces bacterial growth on animate object
    Disinfectants controls bacterial growth or non animate objects

    OR

    In cationic detergents cation acts an detergent
    Eg: Cetyl trimethyl ammonium bromide.
    In Anionic detergents, anion acts as detergent
    Eg: Sodium lauryl sulphate

23. a) \(2\text{MnO}_4^- + \text{H}_2\text{O} + \text{I}^- \rightarrow 2\text{MnO}_2 + \text{IO}_3^- + 2\text{OH}^-\) 2
    b) \(2\text{MnO}_4^- + 10\text{I}^- + 16\text{H}^+ \rightarrow 2\text{Mn}^{2+} + 5\text{I}_2 + 8\text{H}_2\text{O}\) 2

24. Rate \(\propto [A]^n\); rate \(\propto [B]^m\) 2
    Average rate is measured in average interval of time and instantaneous rate is measured in an instant of time.

25. The curves obtained by plotting fraction of gas adsorbed Verses pressure at constant temperature is known as adsorption isotherm 2
\( \frac{x}{m} = k \cdot p^n \)

\( x \rightarrow \) mass of adsorbate

\( m \rightarrow \) mass of adsorbant

OR

Shape selective catalysis

Catalyst activity depends upon shape & size of pores present in the catalyst. ZSM5 is used to convert ethanol to gasoline.

26. \( \text{Ni} \mid \text{Ni}^{2+} \parallel \text{Cu}^{2+} \mid \text{Cu} \)

\[ E = E^\circ - \frac{0.059}{2} \log \left( \frac{\text{Ni}^{2+}}{\text{Cu}^{2+}} \right) \]

27. a) Solute associates
    b) solute dissociates

SECTION – C

28. 28. a)

\[ \text{CH}_2 = \text{C} - \text{CH} = \text{CH}_2 \]
\[ \rightarrow \text{Cl} \]

b)

\[ \text{NH}_2 - \left( \text{CH}_2 \right)_6 - \text{NH}_2, \text{COOH} \]
\[ \rightarrow \left( \text{CH}_2 \right)_4 - \text{COOH} \]
\[
\begin{align*}
&\text{CH}_2\text{OH} + \text{HOOC-COOH} \\
\text{OR} \\
&i) \text{NH}_2-(\text{CH}_2)_6-\text{NH}_2 \text { hexamethylene diamine }, \quad (\text{CH}_2)_4-\text{COOH} \quad \text{Adipic acid} \\
\quad \text{ii) } \text{CH}_2=\text{CH}-\text{CH}=\text{CH}_2 \\
&\quad \text{1,3 butadiene} \\
\quad \text{iii) } \text{CH}_2=\text{C}-\text{CH}=\text{CH}_2 \\
&\quad \text{2-chloro-1,3-butadiene}
\end{align*}
\]

<table>
<thead>
<tr>
<th>29.</th>
<th>a) Potassium hexa cyanido manganate (II)</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \text{Mn}^{2+}\text{[Ar]}3d^5 )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>( t_2g^5eg^0 )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Stability of complexes increases due to presence of bidentate ligands</td>
<td></td>
</tr>
<tr>
<td></td>
<td>eg: ([ \text{Co(en)}3]^{3+} )</td>
<td></td>
</tr>
</tbody>
</table>

[OR]

<table>
<thead>
<tr>
<th></th>
<th>i) ( [\text{Fe(CN)}_6]^{4-} )</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( d^2sp^3 ) - diamagnetic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ii) ([ \text{CO}_6]^{3-} )</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>( sp^3d^2 ) - Paramagnetic</td>
<td></td>
</tr>
</tbody>
</table>
### 30.

<table>
<thead>
<tr>
<th>iii) $[Ni(CO)_4]$</th>
<th>$sp^3$ - diamagnetic</th>
</tr>
</thead>
</table>

### 31.

| a) Due to $\text{+R}$ effecting $\text{NH}_2$ group ion electrons are not localized | 1 |
| b) Since aniline form a salt with lewis and $\text{AlCl}_3$ | 1 |
| c) Since Aryl halide are less reactive towards nucleophilic substitution reaction | 1 |

### 32.

| $\text{Al}_2\text{O}_3 + 2\text{NaOH} + 3\text{H}_2\text{O} \rightarrow 2\text{NaAl(OH)}_4$ | 1 |
| $2\text{NaAl(OH)}_3 + \text{CO}_2 \rightarrow \text{Al}_2\text{O}_3 \cdot \text{XH}_2\text{O}$ | 1 |
| $\text{Al}_2\text{O}_3 \cdot \text{XH}_2\text{O} \rightarrow \text{Al}_2\text{O}_3 + \text{XH}_2\text{O}$ | 1 |

### 33.

| Limiting molar conductivity of an electrolyte is sum of individual limiting molar conductivities of ions | 1 |
| $\Lambda_m^{\circ}$ of $\text{Sr}^{2+} = 119 \text{SCm}^{-2} \text{mol}^{-1}$ | 1 |
\[ \Lambda_m^o \text{ of } NO_3^- = 72 \text{ Scm}^{-2} \text{ mol}^{-1} \]

\[ \Lambda_m^o \text{ Sr(}NO_3)_2 = 119 + 144 = 263 \text{ Scm}^{-2} \text{ mol}^{-1} \]

<table>
<thead>
<tr>
<th>34.</th>
</tr>
</thead>
</table>

\[ \Delta T_f = \frac{K_f \times \omega \times 1000}{GM \omega \times \omega} \]

\[ = \frac{1.86 \times 31 \times 1000}{62 \times 600} \]

\[ = \frac{18.6}{12} = 1.55 \]

Freezing point = 273 – 1.55

\[ = 271.45 \text{ K} \]

### SECTION – D

<table>
<thead>
<tr>
<th>35.</th>
</tr>
</thead>
</table>

a) i) \( CH_3CH_2COCH_2CH_3 \)

3-pentanone

ii) \( CH_3CH_2COCH_2CH_3 \xrightarrow{Zn-Hg/HCl} CH_3CH_2CH_2CH_2CH \)

n-pentane

b) i) \( CH_3CH_2COOH \xrightarrow{Br_2/\text{red } P} Br \)

(HVZ reaction 2 – bromo propanoic acid)

ii) \( CH_2Cl \xrightarrow{aq KOH} CH_2OH \xrightarrow{PCC} \)

CHO

<table>
<thead>
<tr>
<th>36.</th>
</tr>
</thead>
</table>

c) i) Benzaldehyde does not give iodoform reaction while Acetaldehyde responds to iodoform

OR
(i) 
\[ \text{CH}_3 \]
\[ \text{CH}_3\text{COCH}_3 \xrightarrow{\text{Ba(OH)}} \text{CH}_3\text{CCH}_2\text{COCH}_3 \]
\[ \text{OH} \]
\[ \text{(A)} \downarrow \Delta \]

\[ + \text{CHI}_3 \xleftarrow{\text{CH}_3 - C = \text{CHCOCH}_3} \]
\[ \text{(C)} \]

\[ \text{CH}_3 - C = \text{CHCOO}\text{Na} \]
\[ \text{(D)} \]

(ii) 
\[ \text{CH}_3 \]
\[ \text{A} \rightarrow \text{CH}_3 - C - \text{CH}_2\text{COCH}_3 \]
\[ \text{OH} \]

\[ \text{B} \rightarrow \text{CH}_3 - C - \text{CHCOCH}_3 \]
\[ \text{CH}_3 \]

\[ \text{C} \rightarrow \text{CHI}_3 \]
\[ \text{D} \rightarrow \text{CH}_3 - C = \text{CHCOO}\text{Na} \]

(iii) 4-hydroxy-4-methyl-2-pentanone
b) i) Ethanol does not give reaction with NaHSO$_3$ while propanone gives white crystalline precipitate with NaHCO$_3$

ii) Benzoic acid give violet colour with FeCl$_3$

36. a) i) Zero order

ii) Rate constant

iii) mol L$^{-1}$ s$^{-1}$

b) $K = \frac{2.303}{25} \log_{10} \frac{100}{75}$

$K = \frac{2.303}{25} \times (\log 4 - \log 3)$

$K = \frac{2.303 \times 0.1249}{25} = 0.2976 = 1.15 \times 10^{-2} \text{mol}^{-1}$

$= \frac{0.693}{K}$

$= \frac{0.693}{0.0115}$

$= 60.2 \text{ min}^{-1}$

[OR]

$a) t_{1/2} = \frac{0.693}{K} = \frac{0.691}{60} = 0.0115$

= 4 \times t_{1/2}

= 4 \times 0.0115

= 0.046 \text{ s}^{-1}$

b) i) concentration of reactants

ii) temperature

c) i) greater than or equal to threshold energy

ii) lesser activation emerge barriers

37. a) A $\rightarrow$ Sulphur
B → SO₂
C → SO₃
D → H₂S₂O₇
E → H₂SO₄
F → CuSO₄

b) \(Cu + 2H₂SO₄ \rightarrow CuSO₄ + 2H₂O + SO₂\)

c) i) In the preparation of fertilizers
   ii) Paper industry

[OR]

a) due to high electronegativity and positive SRP 1
b) Due to very weak vander waal’s forces. 1
iii) Due to smaller size of ‘O’ 1

b) \(2NaOH + Cl₂ \rightarrow NaCl + NaOCl + H₂O\) 1
2I⁻ + H₂O + O₃ → I₂ + 2OH⁻ + O₂