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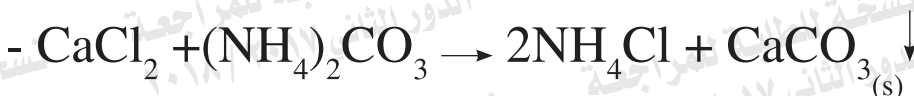
1- (One mark for the chosen question)

(a) The second transition series (P.4)

(b) Crushing processes. (P.18)

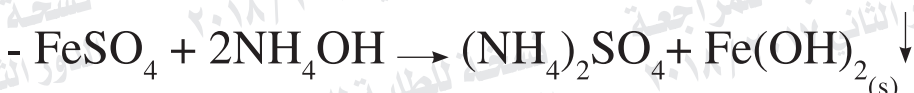
2- (One mark for the chosen question)

(a) Detection for calcium cation (Ca^{2+}) (P.43)



a white ppt. of calcium carbonate

(b) Detection for iron (II) cation (Fe^{2+})



White ppt. turns white green when it exposed to air. (P.42)

3- (One mark for the chosen question)

(a) Because ammonium acetate solution is a weak electrolyte incompletely ionized while sodium chloride solution is a strong electrolyte, completely ionized. The law of mass action is applied only on the weak electrolytic solution.

(P. 70 - 71)

(b) Because some molecules of the reactants didn't have a minimum amount of kinetic energy to react during collision

Or

They didn't have activation energy.

(P.64)

4- (One mark for the chosen question)

(b) Nitrite and silver.

(P.37, 41)

5- (One mark)



The reddish brown colour degree increases.

(P.64 -65)

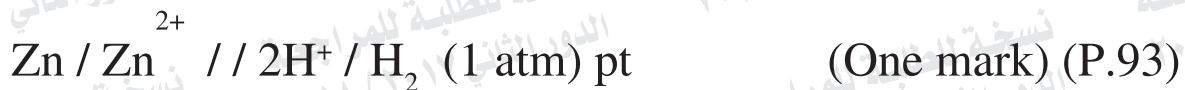
6- (One mark)

(c) $\text{Cr}^{2+} / \text{Mn}^{3+}$

(P.8)

7- (Two marks)

First: The cell diagram for the galvanic cell



Second: emf = summation of oxidation and reduction potential of the two half cells. (One mark)

$$= 0.76 + \text{Zero} = 0.76 \text{ Volt} \quad (\text{P.96})$$

Or The difference in oxidation Potential.

Or The difference in reduction Potential.

8- (Two marks)

Polymer	Type of polymerization	Structural formula of the polymer
Dacron (One mark)	Condensation	$\text{HO}-\text{C}(=\text{O})-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{O}-\text{CH}_2-\text{CH}_2-\text{OH}$ <p style="text-align: right;">(P.202)</p>
Teflon (One mark)	addition	$\left[\begin{array}{c} \text{F} \quad \text{F} \\ \quad \\ \text{---C---C---} \\ \quad \\ \text{F} \quad \text{F} \end{array} \right]_n$ <p style="text-align: right;">(P.146)</p>

9- (Two marks)

Steps: (1/2 mark)

1- Heat organic substance (leather) with copper (II) oxide in a test tube.

2- Pass the resulting gases over white anhydrous copper sulphate, then through clear lime water.

Observations:

1- The white colour of anhydrous copper (II) sulphate turns into blue and lime water turns turbid. (1/2 mark)

2- Organic compound (leather) contains mainly carbon and hydrogen elements.



(P.129 - 130)

10- (One mark for the chosen question)

- (a) Primary cells. (P.98)
(b) The gram equivalent mass of the substance. (P.111)

11- (One mark)

- (b) Halogenation of toluene (P.155)

12- (One mark)

- Copper sulphide (CuS) (P.41, 37)

13- (One mark)

- (b) Amino acids. (P.195)

14- (One mark)

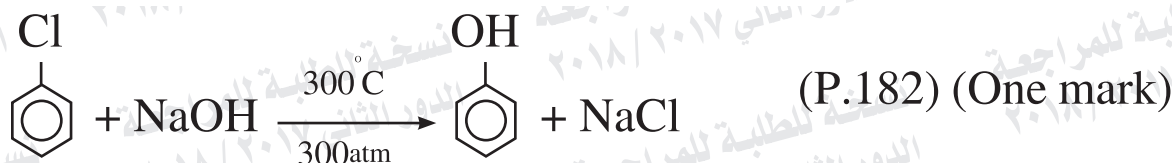
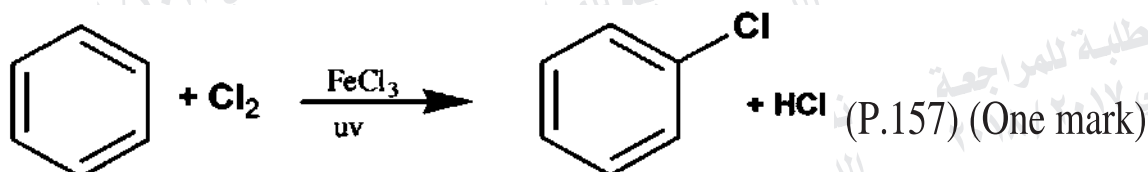
Because sodium chloride solution and ammonium acetate solution are neutral media and methyl orange is orange in neutral media and doesn't affect on the colour of the methyl orange. (P.45)

15- (One mark)

Because it is supplied with fuel from an external source and doesn't store energy. (P. 100)

16- (Two marks for the chosen question)

a)



b)



17- (Two marks)



$$\frac{M_a V_a}{n_a} = \frac{M_b V_b}{n_b} \quad (\frac{1}{2} \text{ mark})$$

$$\frac{15 \times 0.2}{1} = \frac{M_b \times 10}{1} = \frac{15 \times 0.2}{10} = 0.3\text{M} \quad (\frac{1}{2} \text{ mark})$$

KOH mass = concentration x volume x molar mass

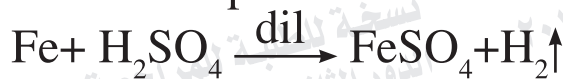
$$= 0.3 \times 0.5 \times 56 = 8.4 \text{ g} \quad (\frac{1}{2} \text{ mark})$$

$$\text{The percentage of KOH} = \frac{8.4}{10} \times 100 = 84 \% \quad (\frac{1}{2} \text{ mark})$$

18- (Two marks)

On adding iron to the two acids

- Dilute sulphuric acid:



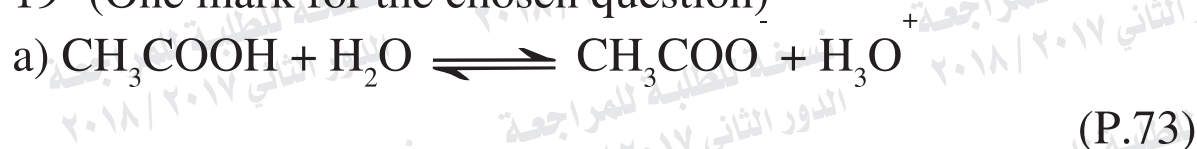
Hydrogen gas evolved

- Concentrated sulphuric acid



Sulphur dioxide gas evolved which has a very irritating smell and turns a paper wet with potassium dichromate acidified by sulphuric acid to green. (P.22 , 36)

19- (One mark for the chosen question)



20- (One mark for the chosen question)

(a) Because they have nearly the same atomic radii, chemical properties and crystalline structure (P.21)

(b) Because the strong metallic bond which is formed due to the sharing of both 4s and 3d electrons in the formation of this bond.

21- (One mark for the chosen question)

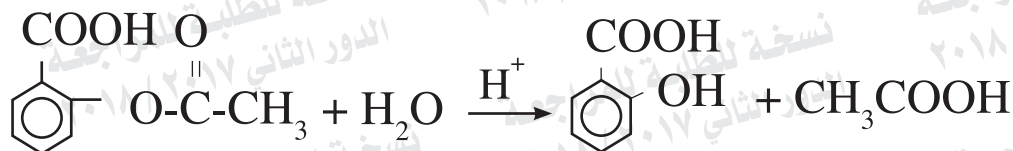
a-

Reagent	Barium phosphate	Barium sulphate
Adding dilute hydrochloric acid	The precipitate is soluble in dil. HCl (p.40)	The precipitate is insoluble in dil. HCl (p.41)

b-

Reagent	Silver iodide	Silver phosphate
Adding ammonia solution	the precipitate insoluble in ammonia solution (P.39)	the precipitate soluble in ammonia solution (P.40)

22- (One mark)



(P.203)

23- (One mark)

(d) Diamagnetic and colourless.

(P.8, 9)

24- (One mark)

Frist: Removing oxygen.

The concentration of SO_3 decreases.

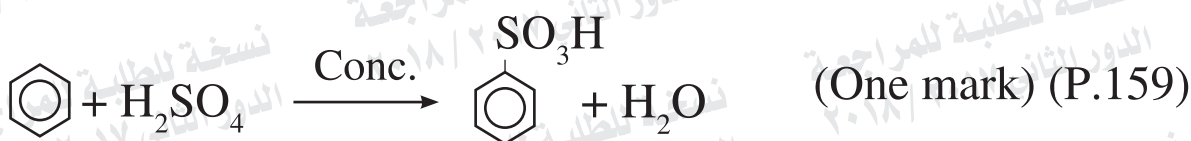
(1/2 mark)

Second: Increasing the pressure.

The concentration of SO_3 increases.

(P.65) (1/2 mark)

25- (Two marks)



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26- (Two marks)

$$\text{The gram equivalent mass} = \frac{27}{3} = 9 \text{ g}$$

$$\text{Quantity of electricity (C)} = \frac{\text{Mass of deposited substance}}{\text{Equivalent mass of deposited substance}} \quad (1/2 \text{ mark})$$

$$= \frac{96500 \times 1.8}{9} = 19300 \text{ C} \quad (1/2 \text{ mark}) \quad (\text{P.114})$$

Quantity of electricity = current strength x time

$$\text{Time (Second)} = \frac{\text{Quantity of electricity}}{\text{current strength}} \quad (1/2 \text{ mark}) \quad (\text{P.112})$$

$$= \frac{19300}{10} = 1930 \text{ Second} \quad (1/2 \text{ mark})$$

27- (Two marks)



(B)



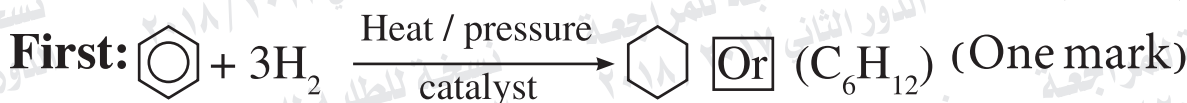
Unsaturated

(A)

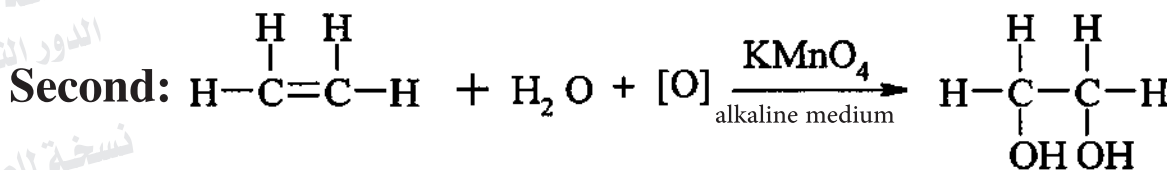


Saturated

(P.156)



(P.156)



ethylene glycol

(P.143) (one mark)

28- (One mark for the chosen question)

(a) Titration (P.44)

(b) Standard solution (P.44)

29- (One mark)

Reagent	Ethyl alcohol	Dimethyl ether
Reaction with sodium	Sodium replaces hydrogen of hydroxyl group and hydrogen gas evolves. (P.128)	Does not react

30- (One mark)

(b) Greater than one. (P.60)

31- (One mark)

Because a galvanic cell is formed in which iron becomes more active metal and anode while tin becomes less active metal and cathode, so iron corroded. (P.107)

32- (One mark)



$$K_{sp} = [\text{Ca}^{+2}] [\text{F}^{-}]^2 \quad (1/2 \text{ mark})$$

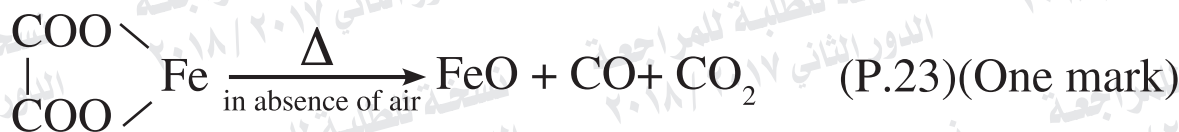
$$= [2 \times 10^{-4}] [2 \times 2 \times 10^{-4}]^2 = 3.2 \times 10^{-11} \quad (1/2 \text{ mark})$$

33- (One mark)

Because the ppt. of magnesium bicarbonate is formed which is soluble in water and turns into magnesium carbonate after heating which is sparingly soluble in water. (P.36)

34- (Two marks) for the chosen question

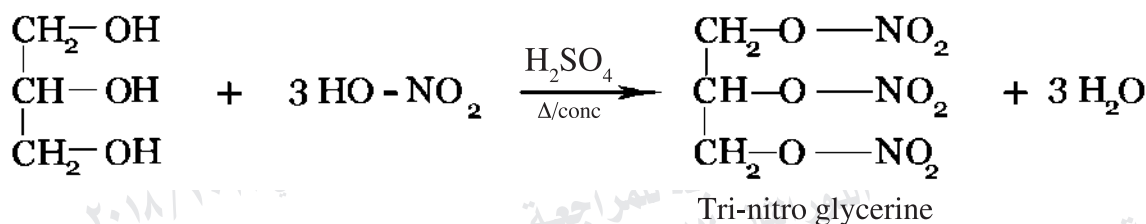
(a)



(b)



35- (Two marks)



(One mark)

The name of the product is : Tri-nitro glycerine.

(P.181) (½ mark)

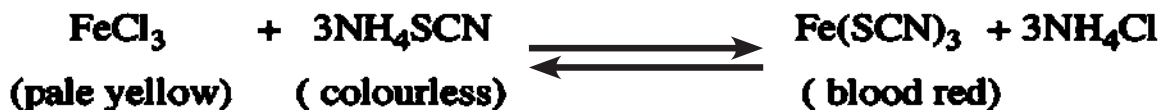
Its importance is:

- Used in the preparation of explosive substance
 - It is also used to widen arteries in the treatment of heart problem.
- (½ mark) (P.181)

36- (Two marks)

Add iron (III) chloride solution to ammonium thiocyanate solution (colourless).

The colour of the solution turns blood red due to the formation of iron (III) thiocyanate. (½ mark)



(One mark)

If an excess amount of iron (III) chloride is added, the red colour of the solution increases indicating the formation of more iron (III) thiocyanate. (P.61) (½ mark)

37- (One mark for chosen question)

(a) phenol. (P.168)

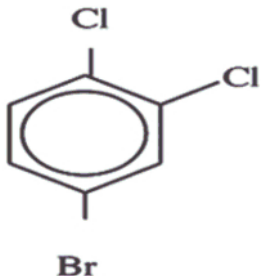
(b) Methanol Or Methyl alcohol. (P.168)

38- (One mark)

$$[H^+] = \sqrt{K_a \cdot C_a} \quad (p.74) \quad (1/2 \text{ mark})$$

$$[H^+] = \sqrt{1.8 \times 10^{-5} \times 0.1} = 1.34 \times 10^{-3} \quad (1/2 \text{ mark})$$

39- (One mark)

Chemical Formula	IUPAC Name
$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{C}\equiv\text{C}-\text{H} \\ \quad \\ \text{H} \quad \text{Br} \end{array} $	<p>3-Bromo-1-butyne (½ mark) (P.147)</p>
	<p>4-Bromo-1,2-dichlorobenzene (½ mark) (P.165)</p>

40- (One mark)

By using dilute hydrochloric acid. Or

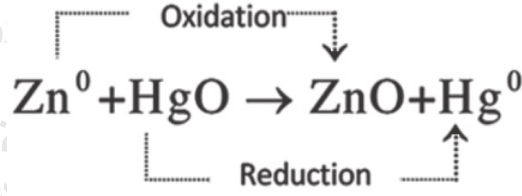
Any dilute mineral acid.

(p.22)

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41- (One mark)



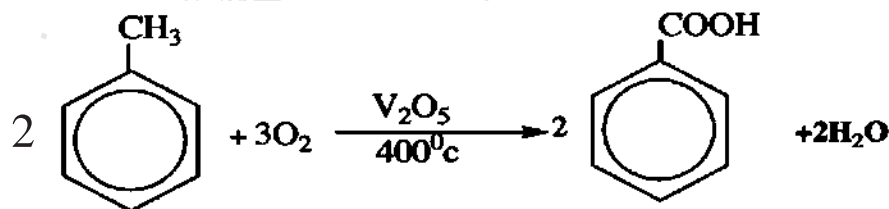
(P.99)

42- (One mark)

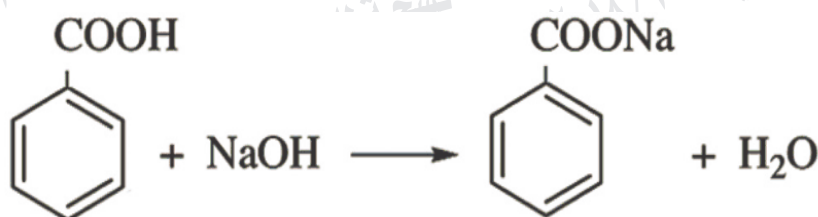
(a) CH_3COOH

(P.70)

43- (Two marks for the chosen question)

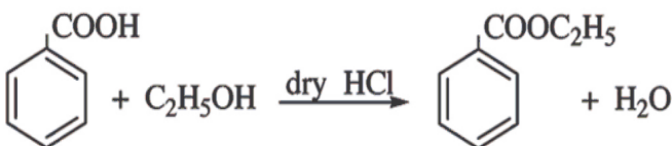


(P.193) (One mark)



(P.194) (One mark)

b)



(P.194)(One mark)



(P.200) (One mark)

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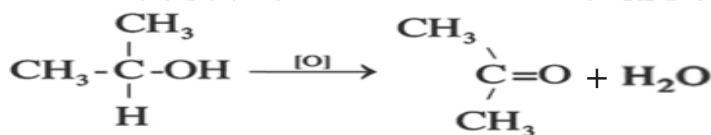
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44- (Two marks)



(P.174) (One mark)



Propanone

(One mark) (P.179)

45- (Two marks)

First: The mass of electrode (B) increases or silver deposits on it or plated by silver layer. (1/2 mark)



Second:

$$\text{Mass of deposited Ag} = \frac{\text{Quantity of electricity} \times \text{eq. mass}}{1F} \quad (1/2 \text{ mark})$$

$$= \frac{0.1 \times 108}{1} = 10.8 \text{ g} \quad (1/2 \text{ mark})$$

Another answer:

$$\text{Equivalent mass of Ag} = \frac{108}{1} = 108 \text{ g}$$

$$\text{Mass of deposited Ag} = \frac{\text{Quantity of electricity (C)} \times \text{eq. mass}}{96500} \quad (1/2 \text{ mark})$$

$$= \frac{108 \times 9650}{96500} = 10.8 \text{ g} \quad (1/2 \text{ mark})$$