EXERCISE

Exercise 1

Choose the correct answer or complete.

1. Carbon atom has valency

(a) Zero (b) Two (c) Three (d) Four

2. Which is a saturated hydrocarbon?

(a) Methane (b) Ethene (c) Ethyne (d) Propene

3. Which is a functional group?

(a) Methyl (b) Ethyl (c) Propyl (d) Hydroxyl

4. Which of the following is a ketone?

(a) Propanone (b) Propanal (c) Propanoic acid (d) Propanol

5. Which of the following is a ester?

(a) Methanol (b) Ethanol (c) Methyl ethanoate (d) Ethanoic acid

6. Which element forms alloy

(a) Metal (b) Metalloid (c) Metallic and metal (d) Metallic and metalloid

7. Which non-metallic is liquid at room temperature?

(a) Carbon (b) Bromine (c) Iodine (d) Sulphur

8. Which non-metallic is magnetic field?

(a) Carbon (b) Oxygen (c) Nitrogen (d) Sulphur

9. Which element is used in fuel cells?

(a) Hydrogen (b) Carbon (c) Nitrogen (d) Sulphur

10. Which element is used in fertilizers?

(a) Nitrogen (b) Carbon (c) Sulphur (d) Hydrogen

11. Which element is used in batteries?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Lithium

12. Which element is used in electrodes?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Lithium

13. Which element is used in electrical wires?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Copper

14. Which element is used in jewellery?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Gold

15. Which element is used in medicine?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Iodine

16. Which element is used in photography?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silver

17. Which element is used in rubber?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Sulphur

18. Which element is used in glass?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

19. Which element is used in paper?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

20. Which element is used in cement?

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21. Which element is used in ceramics?

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252. Which element is used in glass?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

253. Which element is used in paper?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

254. Which element is used in cement?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

255. Which element is used in ceramics?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

256. Which element is used in fertilizers?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

257. Which element is used in explosives?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

258. Which element is used in fuel?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

259. Which element is used in water purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

260. Which element is used in air purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

261. Which element is used in food preservation?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

262. Which element is used in medicine?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

263. Which element is used in photography?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

264. Which element is used in rubber?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

265. Which element is used in glass?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

266. Which element is used in paper?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

267. Which element is used in cement?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

268. Which element is used in ceramics?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

269. Which element is used in fertilizers?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

270. Which element is used in explosives?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

271. Which element is used in fuel?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

272. Which element is used in water purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

273. Which element is used in air purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

274. Which element is used in food preservation?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

275. Which element is used in medicine?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

276. Which element is used in photography?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

277. Which element is used in rubber?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

278. Which element is used in glass?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

279. Which element is used in paper?

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299. Which element is used in air purification?

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300. Which element is used in food preservation?

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301. Which element is used in medicine?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

302. Which element is used in photography?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

303. Which element is used in rubber?

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304. Which element is used in glass?

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310. Which element is used in fuel?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

311. Which element is used in water purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

312. Which element is used in air purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

313. Which element is used in food preservation?

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318. Which element is used in paper?

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(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

321. Which element is used in fertilizers?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

322. Which element is used in explosives?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

323. Which element is used in fuel?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

324. Which element is used in water purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

325. Which element is used in air purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

326. Which element is used in food preservation?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

327. Which element is used in medicine?

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335. Which element is used in explosives?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

336. Which element is used in fuel?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

337. Which element is used in water purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

338. Which element is used in air purification?

(a) Carbon (b) Sulphur (c) Nitrogen (d) Silicon

339. Which element is used in food preservation?

(a) Carbon

Multiple Choice Questions

1) d and f blocks elements are called:

a) s block b) f block

c) transition elements d) actinide

2) Zn, Cd, Hg are not regarded as transition elements because they have completely filled:

a) f orbitals b) d orbitals c) s orbitals d) p orbitals

3) Mn has maximum oxidation states, and goes up to:

a) +8 b) +10 c) +7 d) +2

4) Mixture of ZnO and CraO3 is used for the manufacture of _____.

a) ethanol b) acetone

c) methyl alcohol d) primary alcohol

5)_____ is used to oxidize SO2 to SO3 in the manufacture of H2SO4.

a) V205 b) H2SO4 c) PO4 d) SO2

6)_____ is mixture of two or more than two metals.

a) transition elements b) alloy

c) brass d) nichrome

7) Brass is a strong alloy of

a) barium b) magnesium c) manganese d) copper

8) Those compounds which contain complex molecules or complex ions capable of independent existence are called

a) coordination compound b) organometallic compound

c) alloys d) ligands

9) A metal atom is surrounded by a number of

a) alloys b) ligands

c) complex compound d) coordination sphere

10) Those ligands which how two donatable electron pairs are called.

a) polydentate ligands b) bisteriate ligands c) ligands d) alloys

11) Potassium dichromate (VI) solution acidified which dilute sulphuric acid is commonly as an

a) reducing agent b) oxidising agents

c) reduction d) none

12) When Potassium manganate solution run into the reaction, the solution becomes.

a) odorless b) colourless c) tasteless d) bitter

13) Chromate (VI) ions will give a bright yellow precipitate of _____

a) chromium b) sulphuric acid

c) HCl d) lead chromate

14) Manganese can exist in a number of oxidation states, but most stable in an oxidation state of

a) +2, +4 and +7 b) +3, +6 and +8

c) +1, +2 and +7 d) +6, +3 and +6

15) Complete the following reaction.

a) $[Mn(H_2O)_6]2 + 2OH \longrightarrow [Mn(H_2O)_4(OH)_2] + 2H_2O$

b) $[Mn(H_2O)_2]2 + 2H_2O \longrightarrow [Mn(H_2O)_4(OH)_2] + 2H_2O$

c) $[Mn(H_2O)_2] 2+ 2H_2O \longrightarrow [Mn(H_2O)_4(OH)_2] + 2H_2O$

d) $[Mn(H_2O)_{10}]2 + 6H_2O \longrightarrow [Mn(H_2O)_4(OH)_2] + 2H_2O$

16) Coinage metals are actually.

a) halogens b)alkali metals

c) transition metals d) Alkaline earth metals

17) Which are repelled by magnetic field?

a) paramagnetic b) ferromagnetic

c) diamagnetic d) none

18) The unit of Magnetic moments is

a) coulombs (Q) b) amperes (A)

c) bohr magneton (BM) d) watts (W)

19) Potassium manganate (VII) is usually used in

a) neutral or alkaline solution b) alkali solution

c) transition metals d) oxidising agent

20) Potassium magnate (VII) oxidizes

a) carbon-hydrogen bonds b) carbon-carbon double bonds

c) carbon-oxygen bonds d) none

21) Alkaline potassium manganate (VII) solution oxidizes any hydrocarbon side chain attached to a benzene ring back to a single

a) CH_3 b) COOH group

c) CH_3OH d) $KMnO_4$

22) Potassium magnate (VII) solution is always used in

a) basic solution b) acidic solution

c) neutral solution d) both acidic as well as basic solution

23) Iron exists in two common oxidation state

a) +2 (Fe^{2+}) and +3 (Fe^{3+}) b) +4 (Fe^{4+}) and +2 (Fe^{2+})

c) +5 (Feb and +6 (Fe^{6+}) d) +3 (Fe^{3+}) and +4 (Fe^{4+})

24) (Fe^{2+}) ion is thus a

a) oxidizing agent b) reducing agent

c) oxidizing agent as well as reducing agent d) none

25)Ammonia can act as both a

a) base and a liquid b) acid and a liquid

c) acid and a base d) base and neutral

26)Complete the following reaction. 2[Fe$(H_2O)_6]^{3+}$ +3CO_3^{2-} →

a) 2 Fe$[(H_2O)_3(OH)_3]$ + 3 CO_2+ 3 H_2O

b) 2 [Fe$[(H_2O)_3(OH)_3]$] +6 CO_2+ H_2O

c) [Fe $[(H_2O)\ (OH)_3]]$ + CO_2 + H_2O

d) [Fe $[(H_2O)\ (OH)_3]$]+ 2CO_2+ H_2O

Answers

1)	c	**2)**	b)	**3)**	c)	**4)**	c)
5)	a)	**6)**	b)	**7)**	d)	**8)**	a)
9)	b)	**10)**	b)	**11)**	b)	**12)**	b)
13)	d)	**14)**	a)	**15)**	a)	**16)**	b)
17)	c)	**18)**	c)	**19)**	a)	**20)**	b)
21)	b)	**22)**	d)	**23)**	a)	**24)**	b)
25)	a)	**26)**	a)				

Short Answers and Questions

Q1 Why are they called transition elements?

Answer

They are called transition because they occupy a place in short periodic table between s- and p-block elements. Their properties are intermediate between those of s- and p-block elements. They are called transition elements because they show such properties which are transitional between those of s- and p-block elements. Transition elements have high melting and boiling points, they form colour and paramagnetic ions and form alloys.

Q2 Write down the 3 general features of transition elements.

Answer

- They are d-block metals.
- Some of the transition elements are also an important role in the industry. These are used as catalysts, alloys, and in the form of compounds.
- They are all metals and metals with high melting and boiling points. They also have good conductivity of heat and electricity.
- They form alloys with other metals and their compounds of particular metals as well.
- With d-line excitations, they show variable oxidation states.
- Their ions are coloured because the d-orbitals are split into two different energy levels.

Q3 Why is Zn group included in transition elements?

Answer

Zn, Cd and Hg are not regarded as transition elements because they have completely filled d-orbitals in their ground state as well as in their common oxidation states. They form compounds with cerrovac-halide ions and amines and their chemical behaviour is similar to transition elements.

Q4 What is oxidation state of transition elements?

Answer

Transition elements are electropositive, so they have positive oxidation states. All (s) series elements show an oxidation state of +2 to oxidation to higher oxidation state when the electron who shifts from part of bonding.

They show variable oxidation states. The reason is that they have d electrons in addition to the electrons in the outermost shell. Transition elements show variable oxidation states because the d-orbitals and the s-orbitals are very close to each other. The d-2 d electrons can make not +1 to electrons, in the outer shell, and the d-2 d electrons can make +2 to electrons, in the outer shell. Depending on the series the number of oxidation states, can go up to +7.

Q5 Why transition elements are used as catalyst?

Answer

Most of the transition elements are used as catalyst. The compounds of transition elements are used as catalyst. The reason is that they have d-orbitals and they form intermediate ions. In this way, they can form intermediate products with various reactants.

They also form interstitial compounds which can deposits on surface to the reacting species. Some of the important catalyst.

Q6 A mixture of Fe and CrCo used for the manufacture of stainless steel.

- Fe and Co are used in the form of compounds as catalysts in vegetable oil and conversion of alkene and alkane to alkene.
- VHSS Co-Cr-Mo used in the production of the decomposition of H2O2.
- Ni/Co used as catalyst for the manufacture of Ammonia.
- NiSO4 is used to oxidate SO2 to SO3 in the manufacture of H2SO4.

Q7 Why transition metals from d-by with much other and why down the transition metals?

Answer

Alloy is mixture of two or more than two metals. Transition metals form alloy with metals other.

Various: sentimetts form almost similar ##r## mol atoms of the one metal can replace the other metal atoms in the crystal lattice. The alloys are very hard, have very strong interatomic e.g. alloy bronze and cornage alloy are the Bronze alloy.

Properties:

- Alloy are prepared according to the requirements, their characteristics are different well their properties are common which are as follows:
- They are hard and strong.
- They are strong and flexible but heat alloys can also be prepared.
- They have long life because they do not corrode.
- They are durable.
- They have high melting points.

Q7 Define coordination compounds, and explain them.

Answer

Coordinated compounds which contain complex molecules or complexes capable of independent existence are called coordinate compounds or complex compounds. Such compound is formed by the coordination of an electron pair donor to metals atom ion.

In order to understand let us make substance Pt(NH3)4Cl2 ie Cl2 When Pt(NH3)4Cl2 is dissolved in water, it ionizes to give Pt(NH3)4 2+ and 2Cl- ions. 1.00 moles of Pt(NH3)4Cl2 in 1M Mole the new compounds have been given the formula [Pt(NH3)4Cl2]Cl2

$$PtCl_4 + 6NH_3 \rightarrow [Pt(NH_3)_6]Cl_4$$

Complex compound is consisted of these compounds:

- Central metal atom or ion which is a cation or a neutral atom.
- A central metal atom or ion which is surrounded by ligands.
- Electron pair donor which is negatively charged, positively charged or neutral.

Q8. Define ligand? and write down its types?

Answer

The atom ion or neutral molecule which surrounds the central metal atom or ion and donates the electron pair is called ligand.

Example

[Pt(NH3)4Cl2]Cl2 [Pt(NH3)4Cl2]Cl2 in the ligand.

Types

- Monodentate ligands: Those ligands which have only one donatable electron pair. e.g. ammonia,water,chloride (Cl-).
- Bidentate ligands: Those ligands which have two donatable electron pairs. E.g. H2NCH2 — NH — CH2 -CH2 -NH2.
- Ambidentate ligands: Those ligands which have six donatable electron pairs. e.g. ethylenediaminetetra (EDTA).

Q9. Define charge on coordination sphere a figure(s) with example?

Answer

If it the ligandsm sum of charges present on the central metal ion and total charge on the ligands.

Example

In the [Cr(H2O)6] the charge present on the metal ion and total charge on the ligands.

Example in K4 [Fe(CN)6] the charge on the coordination sphere can be calculates as follow

$$K_4[Fe(CN)_6] \longrightarrow 4K^+ + [Fe(CN)_6]^{4-}$$

Since charge on each ligand is −1

Charge on ion is −4

Charge on ion = −2

So the charge on the coordination sphere = +4 + 2 = +6

Q10 Define coordination member (with example)?

Answer

Complexes with [Cr +] or the most common ones formed by transition metal ions.

In figure a c-a coordination compound may be arranged around the metal ion either at the corners of hexagonal prism or at the apices of a hexagonal or at the apices of a regular octahedron. These arrangements together with tetrahedral and square planar are characteristic of the ligands and the nature of metal ion. Arrangement of six ligands in a c-a coordination are tetrahedral squares and as FOK, CSNK. Nickel and Co are also tetrahedral, but planar geometry is found in complexes of Cu+, Ni+, Pt+ and Au+ ion.

Q 11. Write down the the oxidation of the vanadium (III)?

Answer

The vanadium (III) ions easily oxidized if you remove the carbon oxide from the field and your white solution (the vanadium ion) turns green because of its contact with oxygen in the air. It is oxidized back to vanadium (IV).

If it is allowed to stand for a long time the yellow vanadium ions (ie due to the oxidation) finally to the vanadium (V). (Note: +5)

The first stage of the oxidation is:

$$2V^{3+} + 2H^+ \rightarrow 2V^{4+} + H_2$$

The corresponding equilibrium for the pH is

So if you mix together pH and VO3 for the presence of acid to provide the ions.

$$VO_3^- + 2H^+ + e \rightarrow VO^{2+} + H_2O + e^- \rightarrow VO^{2+}$$

$$2V^{3+} + 2H^+ \rightarrow 2V^{4+}$$

You can write these down and combine them to give the ionic equations for the reaction (you want to

$$2 \times (VO^{2+} + 2H^+ \rightarrow V^{4+} + H_2O)$$

$$2V^{3+} + 2H^+ \rightarrow 2V^{4+}$$

$$2VO^{2+} + 4H^+ \rightarrow 2V^{4+} + 2H_2O$$

The other stage of the reaction:

V^{4+} ions for all the steps of the reaction oxidation (V) to Vanadium (II)

$$VO^{2+} + 2H^+ + e \longrightarrow VO^{2+} + H_2O \quad (V^{+5} \rightarrow V^{+4})$$

$$VO^{2+} + 2H^+ + e \longrightarrow V^{3+} + H_2O \quad (V^{+4} \rightarrow V^{+3})$$

$$V^{3+} + e \longrightarrow V^{2+} \quad (V^{+3} \rightarrow V^{+2})$$

And here is the zinc value again:

$$Zn^{2+} + 2e \longrightarrow Zn^{0} \quad (V^{+2} \rightarrow V^{0})$$

Q12 Write down the oxidation of vanadium (II) by nitric acid?

Answer

First step:

$$V^{2+} + e \longrightarrow V^{+3} \quad (V^{+2} \rightarrow V^{+3})$$

$$NO_3^- + 3H^+ + 3e \longrightarrow NO + 2H_2O \quad (V^{+5} \rightarrow V^{+2})$$

The conversion reaction has the more negative E° value and so while more to the left the nitric acid reacts more to the right.

Nitric acid will oxidate (oxidizes) V2+ to vanadium (III).

The second stage is

$$VO^{+} + 2H^{+} + e \longrightarrow VO^{2+} + H_2O \quad (V^{+5} \rightarrow V^{+4})$$

$$VO^{2+} + 2H^{+} + e \longrightarrow V^{3+} + H_2O \quad (V^{+4} \rightarrow V^{+3})$$

The only acid again has the more positive E° value and so moves to the right. The more negative (less positive) conversion reaction moves to the left.

Nitric acid will oxidate oxidize vanadium (III) to vanadium (V).

$$VO^{2+} + 2H^{+} + e \longrightarrow VO^{2+} + H_2O \quad (V^{+5} \rightarrow V^{+4})$$

$$VO^{2+} + 4H^{+} + e \longrightarrow V^{3+} + 2H_2O \quad (V^{+4} \rightarrow V^{+3})$$

Q13 Write down the use of potassium dichromate (VI) as an oxidizing agent in organic synthesis?

Answer

Potassium dichromate (VI) (sodium) with dilute sulphuric acid is commonly used as an oxidizing agent in organic chemistry. It is a reasonably powerful oxidizing agent. Potassium dichromate is usually preferred to make the whole of organic molecule. It's cheap.

Oxidize secondary alcohols to ketones.

Oxidize primary alcohols to aldehydes.

Oxidize primary alcohol to carboxylic acid.

If the alcohol in excess and you will distill the aldehyde as soon as it forms (and you will extract as the main product)

$$CrO^{2-} + 8H^{+} + 3CH_3CH_2OH \longrightarrow 2Cr^{3+} + 7H_2O + 3CH_3CH_2O$$

If the oxidizing agent is in excess and you don't want the product to escape for electrolysis by heating the reaction vessel.

$$CrO^{2-} + 8H^{+} + 3CH_3CH_2OH \longrightarrow 2Cr^{3+} + 7H_2O + 3CH_3COOH$$

In organic chemistry these equations are often simplified to concentrate on what is happening to the organic molecules. For example the last two could be written.

$$CH_3CH_2OH + [O] \longrightarrow CH_3CHO + H_2O$$

$$CH_3CH_2OH + 2[O] \longrightarrow CH_3COOH + H_2O$$

The oxygen within in square brackets [O] is from oxygen from an oxidizing agent.

Q14 Write down the reaction of manganese (IV) ions in solutions oxidation states.

Answer

Acidifiable ions removes hydrogen ions from the H2O ligands attached to the manganese ion.

Once a hydrogen ion has been removed from two of the H2O molecules, you are left with a complex with a charge of neutral charge.

This is neutral or H2O and a paramagnetic is formed.

$$[Mn(H_2O)_6]^{4+} \longrightarrow [Mn(H_2O)_4(OH)_2] + 2H^+$$

The reaction of heterocyclopentane (5 ring with one nitrogen) and pyridine (6 ring with one nitrogen) with the manganese (IV) ion in aqueous solution. Aqueous ions are more reversing hydrogen from the ligus complex.

$$[Mn(H_2O)_6]^{4+} + 2Mn_2 \longrightarrow [Mn(H_2O)_4(OH)_2] + 2Mn^{+}$$

In case of the ethyl side chain you will also get COS with longer side chains, you will get a mixture of other products but each cycle the main product will be between acid.

Q15 Discuss the problems related the use of potassium manganate (VII) solutions?

Answer

There are few things you need to be aware of potassium manganate (VII) can't be used in the presence of hydrochloric acid. Potassium manganate (VII) oxidizes in alkaline amount of the potassium manganate (VI) ion and the solution can't be alkaline and so the Mnation result would be lost.Look. that's easy we don't actually the solution with hydrochloric acid.

Potassium manganate (V) & (VI) is plainly dissolved. That means that it can't be used in the presence of hydrochloric acid. Potassium manganate (VII)

It is strongly colored that it is impossible to see what of the colors you have used have disolved, and no special of time it oxidizes the H2O to dissolved into oxygen. Potassium manganate (VII) solution usually from a fairly concentrated solution.

This is manganese (IV) oxide and it produced when the manganate (VII) ions react with H2O.

Q16 Discuss the use of potassium dichromate (VI) as an oxidizing agent in organic synthesis?

Answer

Potassium manganate (VII) is usually used in neutral or alkaline solution in organic synthesis. Potassium dichromate (VI) (sodium) with dilute sulphuric acid is commonly used as an oxidizing agent. Potassium dichromate (VI) (sodium) with dilute sulphuric acid is usually more mildly alkaline with sodium carbonate solution, and the hydroxide solution manganate, etc.

A fading ion (+2) double bond.

Potassium dichromate (VI) (sodium) solution, carbon dioxide bound and so goes through the colour change.

Chlorine for example is oxidized to sulfonate (+2) ions.

$$Cl_2 + H_2O + 2K^+ \longrightarrow KMnO_4 \quad \frac{CH_3OH}{CH_3OH}$$

The oxygen in ozone (ozone) is taken to mean oxygen from an oxidizing agent, oxidation or alcohols also.

Alkaline potassium manganate (VII) solution oxidizes only hydrocarbon ones chain. Alkaline solution is a fading ions to +2 ion. + CO2H group (protonated) fading is necessary. E.g.

Q17. Discuss the use in catalyst in the Haber process.

Answer

The Haber process combines nitrogen (dinitrogen) from the atmosphere. This comes from the air and the hydrogen is obtained mainly from natural gas (methane) but is used as a catalyst.

$$N_2 + 3H_2 \longrightarrow 2NH_3$$

Q18. Discuss ion ions as a catalyst in the reaction between per sulphate ions and iodide ions?

Answer

The reaction between per sulphate ions (peroxodisulphate) ions S2O8 and iodide ions in solution can be combined using either ion (B) or ion (A). The ion of equation for the reaction is:

$$S_2O_8^{2-} + 2I^- \longrightarrow 2SO_4^{2-} + I_2$$

Ion is very easily oxidized (when oxidized or oxidation. Oxygen in the ion oxidizes the iron. (A) Iodides precipitate to form (B) Iodides precipitate, ions high of the halide. The detaining of the precipitate comes from some effect.

In the iron (B) case.

$$2Fe(SO_4)_3^{2-} \longrightarrow 2Fe(SO_4)_2^{2-}$$

Q19 Write down the reaction of the iron ions with ammonia solution.

Answer

Ammonia can act as both a base and a ligand. In these cases, it simply act as a nucleophile and displaces the aqua complex.

In the iron (A) case

$$[Fe(H_2O)_6]^{2+} + 2NH_3 \longrightarrow [Fe(H_2O)_4(OH)_2] + 2NH_4^+$$

$$[Fe(H_2O)_6]^{2+} \longrightarrow [Fe(H_2O)_4(OH)_2]$$

On standing precipitate darkens and turn orange around the top.

The appearance is just the same as when you add sodium hydroxide solution. The precipitate again changes colour in the iron (B) hydroxide complex is oxidized by the air to iron (III) hydroxide.

Q20 Write down the complex dative and reaction, of hexaqua copper (II) ions with carbonate ions?

Answer

Carbonate anion

The colour changes are

$$[Cu(H_2O)_6]^{2+} \xrightarrow{CO_3^{2-}} [Cu(H_2O)_5CO_3] \xrightarrow{CO_3^{2-}} [Cu(H_2O)_4CO_3]^{2+}$$

The reaction of hexaqua copper (II) ions with carbonate ions.

$$[Cu(H_2O)_6]^{2+} \longrightarrow [Cu(H_2O)_4CO_3]$$