

QB365 Question Bank Software Study Materials

p - Block Elements - I Important 2 Marks Questions With Answers (Book Back and Creative)

12th Standard

Chemistry

Total Marks : 40

2 Marks

20 x 2 = 40

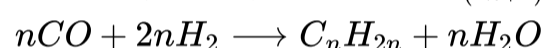
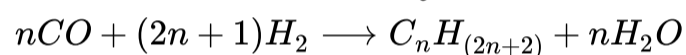
- 1) What is catenation ? describe briefly the catenation property of carbon.

Answer : Catenation is an ability of an element to form chain of atoms.

The conditions for catenation.

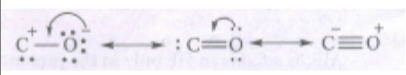
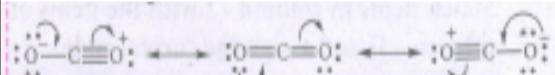
- The valency of element is greater than or equal to two.
 - Element should have an ability to bond with itself
 - The self bond must be as strong as Its bond with other elements
 - Kinetic inertness of catenated compound towards other molecules.
 - Carbon possesses all the above properties and forms a wide range of compounds with itself and with other elements such as H, O, N, S and halogens.
- 2) Write a note on Fisher tropsch synthesis.

Answer : The reaction of CO with hydrogen at a pressure of less than 50 atm using metal catalysts at 500 - 700 K yields saturated and unsaturated hydrocarbons.



- 3) Give the structure of CO and CO₂.

Answer :

Oxides of Carbon	Structure	Parameters
CO		Three electron pairs are shared between carbon and oxygen. The C-O bond distance is 1.128 Å.
CO ₂		Equal bond distance for the both C-O bonds. Two C-O sigma bond, It has 3c-4e bond.

- 4) Describe the structure of diborane.

Answer : (i) In diborane two BH₂ units are linked by two bridged hydrogens.

(ii) It has eight B-H bonds.

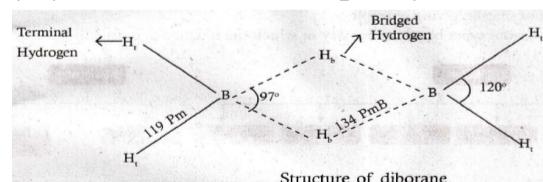
(iii) Diborane has only 12 valance electrons.

(iv) The four terminal B-H- bonds is "**2c - 2e**" bond (two centre - two electron bond.)

(v) Two three centred B - H - B bonds two electrons each. "**(3c - 2e)**"

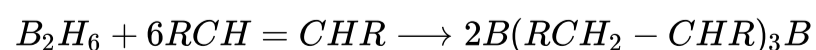
(vi) In diborane, the boron is "sp³" hybridised

(vii) Three of the four "**sp³**" hybridised orbitals contains single electron and the fourth orbital is empty.



- 5) Write a short note on hydroboration.

Answer : Diborane adds on to alkenes and alkynes in ether solvent at room temperature. This reaction is called hydroboration.



- 6) Give one example for each of the following

- icosogens
- Tetragens

(iii) pnictogens

(iv) chalcogens

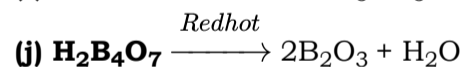
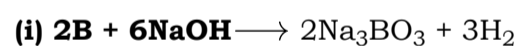
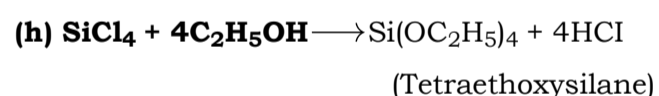
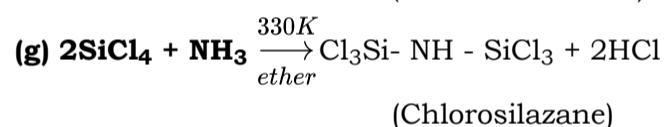
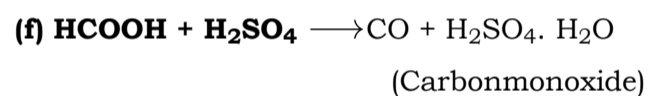
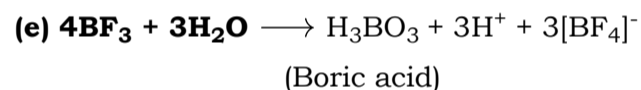
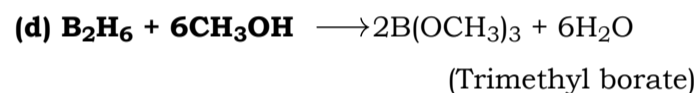
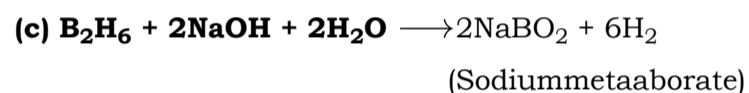
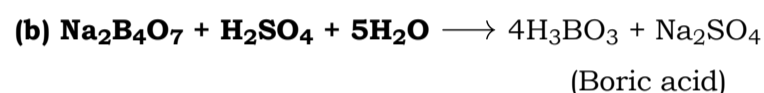
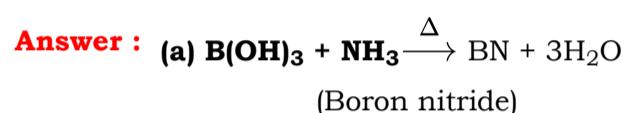
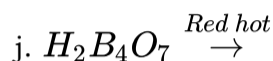
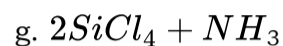
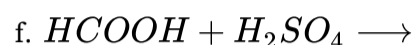
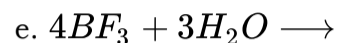
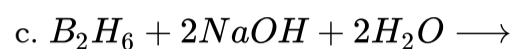
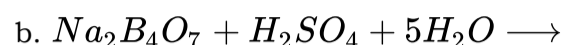
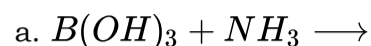
Answer : (i) Icosogens → B, Al, Ga, In, Tl

(ii) Tetragens → C, Si, Ge, Sn, Pb

(iii) Pnictogens → N, P, As, Sb, Bi

(iv) Chalcogens → O, S, Se, Te, Po

7) Complete the following reactions.

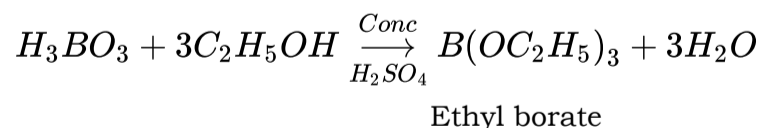


8) How will you identify borate radical?

Answer : When boric acid or borate salt is heated with ethyl alcohol in presence of conc. sulphuric acid, an ester, trialkylborate is formed.

The vapour of this ester burns with a green edged flame

This reaction is used to identify the presence of triethyl borate.



Ethyl borate

(Green edged flame)

9) CO is a reducing agent. Justify with an example.

Answer : CO acts as a strong reducing agent.



It reduces metallic oxides into metals.

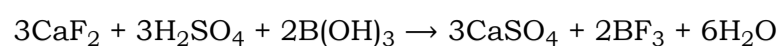
10) Why group 18 elements are called inert gases? Write the general electronic configuration of group 18 elements.

Answer : The elements of group 18 have a completely filled configuration of ns^2np^6 .

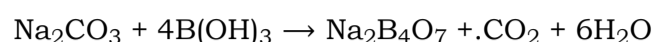
Hence they are more stable and less reactive and so called as noble gases.

11) Explain the formation of boron trifluoride.

Answer : (i) Boric acid reacts with calcium fluoride in presence of conc. sulphuric acid and gives boron trifluoride.



(ii) Borax when heated with soda ash it gives borax



12) What happens to CO_2 when dissolved in water?

Answer : The aqueous solution of carbon dioxide is slightly acidic as it forms carbonic acid.



13) What is inert pair effect?

Answer : (i) In the elements of 4th, 5th and 6th period of the p-block the electrons present in the intervening d and f - orbitals do not shield the s-electrons of the valence shell effectively.

(ii) As a result, ns^2 -electrons remains more tightly held by the nucleus and hence do not participate in bonding. This is called inert pair effect.

14) Among group 14 elements, name

(i) the most electro negative element

(ii) the most metallic element

Answer : (i) Carbon

(ii) Lead (metallic character increases on going down the group).

15) (i) Silicones are used for making waterproof fabrics. Give reason.

(ii) Diamond - bad conductor of electricity.

Answer : (i) All silicones are water repellent. This property arises due to the presence of organic side groups that surrounds the silicon which makes the molecule looks like an alkane.

(ii) In diamond, all four valance electrons of carbon are involved in bonding there is no free electrons for conductivity.

16) Write the allotropy of Selenium.

Answer : 1. Red selenium

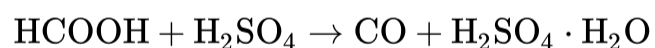
2. Black selenium

3. Grey selenium

4. Monoclinic selenium

17) How is pure 'CO' is prepared?

Answer : Pure CO is prepared by warming methanoic acid with conc H_2SO_4 which acts as a dehydrating agent.



18) Mention any two uses of CO.

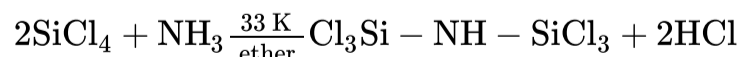
Answer : 1. CO is a good reducing agent and can reduce many metal oxides to metal.

2. CO is an important ligand and forms carbonyl compound with transition metals.

3. Water gas ($\text{CO} + \text{H}_2$) and producer gas ($\text{CO} + \text{N}_2$) are important industrial fuels.

19) What is meant by ammonolysis of SiCl_4 ?

Answer : Silicon tetrachloride reacts with ammonia to form chlorosilanes. This is called ammonolysis.



20) Write the reactions involved.

Answer : When boric acid or borate salt is heated with ethyl alcohol in presence of conc. sulphuric acid, an ester, trialkylborate is formed. The vapour of this ester burns with a green edged flame and this reaction is used to identify the presence of borate.

