



Water gas is produced by?

p-Block Elements

- ZSM-5 is used as a catalyst in the conversion of
 - 1) alkanols to gasoline
 - 2) alkanals to gasoline
 - 3) alkanes to gasoline
 - 4) alkanones to gasoline
- Which of the following statements about H_3BO_3 is not correct?
 - 1) It has a layer structure in which planar BO_3 units are joined by hydrogen bonds.
 - 2) It does not act as proton donor but acts as a Lewis acid by accepting hydroxyl ion.



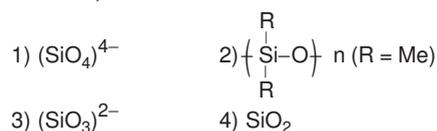
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- It is a strong tribasic acid.
- It is prepared by acidifying an aqueous solution of borax.
- AlF_3 is soluble in HF only in presence of KF. It is due to the formation of
 - 1) $K_3[AlF_3H_3]$
 - 2) $K_3[AlF_6]$
 - 3) AlH_3
 - 4) $K[AlF_3H]$
- The type of hybridisation of Boron in diborane is
 - 1) sp^3
 - 2) sp^2
 - 3) sp
 - 4) dsp^2
- BCl_3 is a planar molecule where as NCI_3 is pyramidal because
 - 1) nitrogen atom is smaller than boron atom
 - 2) BCl_3 has no lone pair but NCI_3 has a lone pair of electrons
 - 3) B-Cl bond is more polar than N-Cl bond
 - 4) N-Cl bond is more covalent than B-Cl bond
- Borax bead test is used to identify some of transition metals because
 - 1) tetraborates are coloured
 - 2) borates are coloured
 - 3) metaborates are coloured
 - 4) borides are coloured
- The formula of inorganic benzene is
 - 1) BN
 - 2) $B_3N_3H_6$
 - 3) B_4C
 - 4) B_2H_6
- Correct statements among a to d regarding silicones are
 - a) They are polymers with hydrophobic character
 - b) They are biocompatible
 - c) In general, they have high thermal stability and low dielectric strength
 - d) Usually, they are resistant to oxidation

- and used as greases
- 1) a, b and c only
 - 2) a and b only
 - 3) a, b, c and d
 - 4) a, b, and d only
9. The correct order of stability of difluorides is:
- 1) $GeF_2 > SiF_2 > CF_2$
 - 2) $CF_2 > SiF_2 > GeF_2$
 - 3) $SiF_2 > GeF_2 > CF_2$
 - 4) $CF_2 > GeF_2 > SiF_2$

10. The basic structural unit of feldspar, zeolites, mica and asbestos is:



11. The number of pentagons in C_{60} and trigons (triangles) in white phosphorus respectively are:

- 1) 20 and 4
- 2) 12 and 4
- 3) 12 and 3
- 4) 20 and 3

12. A metal M forms chlorides in +2 and +4 oxidation states. Which of the following statements about these chlorides is correct?

- 1) MCl_2 is more volatile than MCl_4
- 2) MCl_2 is more soluble in anhydrous ethanol than MCl_4
- 3) MCl_2 is more ionic than MCl_4
- 4) MCl_2 is more easily hydrolysed than MCl_4

13. The straight chain silicone polymer is formed by

- 1) hydrolysis of CH_3SiCl_3 followed by condensation polymerisation
- 2) hydrolysis of $(CH_3)_2SiCl_2$ followed by condensation polymerisation
- 3) hydrolysis of $(CH_3)_4Si$ by addition polymerisation
- 4) hydrolysis of $(CH_3)_3SiCl$ followed by condensation polymerisation

14. Water gas is produced by

- 1) passing steam through a red hot coke bed
- 2) saturating hydrogen with moisture
- 3) mixing oxygen and hydrogen in the ratio of 1 : 2
- 4) heating a mixture of CO_2 and CH_4 in petroleum refineries

15. Nitrogen is prepared in the laboratory by heating a mixture of

- 1) $NH_4OH + NaCl$
- 2) $NH_4NO_3 + NaCl$
- 3) $NH_4Cl + NaOH$
- 4) $NH_4Cl + NaNO_2$

16. H_3PO_2 is the molecular formula of an acid of phosphorus. Its name and basicity respectively are:

- 1) phosphorus acid and two
- 2) hypophosphorus acid and two

- C) $NaHCO_3$
- D) Na_2CO_3

- A) ii iv i iii
- B) ii iii i iv
- C) iii ii i iv
- D) iv iii i ii

4. The metal that forms nitride by reacting directly with N_2 of air, is:

- 1) K
- 2) Cs
- 3) Li
- 4) Rb

5. For alkali metal (M) halides the correct order of increasing covalent character is

- 1) $MF < MCl < MBr < MI$
- 2) $MF < MBr < MI < MCl$
- 3) $MCl < MF < MBr < MI$
- 4) $MI < MBr < MCl < MF$

KEY: 1-4; 2-2; 3-2; 4-3; 5-1.



JEE MAIN Chemistry

- hypophosphorus acid and one
- hypophosphoric acid and two
- How many bridging oxygen atoms are present in P_4O_{10} ?
 - 1) 6
 - 2) 4
 - 3) 2
 - 4) 5
- The oxidation state of bismuth in its compounds with chlorine and magnesium respectively
 - 1) +3, -3
 - 2) -3, +3
 - 3) -3, -3
 - 4) +3, +3
- PCl_3 reacts with water to form
 - 1) PH_3
 - 2) H_3PO_3, HCl
 - 3) $POCl_3$
 - 4) H_3PO_4
- Repeated use of which one of the following fertilizers would increase the acidity of soil?
 - 1) Ammonium sulphate
 - 2) Super phosphate of lime
 - 3) Urea
 - 4) Potassium nitrate
- Which of the following is NOT CORRECT?
 - 1) S_8 molecule is puckered ring having crown shape
 - 2) S_6 is cyclic ring adopting chair form
 - 3) S_2 is diamagnetic at above 1000K
 - 4) Rhombic and monoclinic allotropes of sulphur are stable at 369K i.e. transition temperature.
- Sulphur trioxide can be obtained by which of the following reactions?
 - 1) $CaSO_4 + C \xrightarrow{\Delta}$
 - 2) $Fe_2(SO_4)_3 \xrightarrow{\Delta}$
 - 3) $S + H_2SO_4 \xrightarrow{\Delta}$
 - 4) $H_2SO_4 + PCl_5 \xrightarrow{\Delta}$
- The gases respectively absorbed by alkaline pyrogallol and oil of cinnamon are
 - 1) O_3, CH_4
 - 2) O_2, O_3
 - 3) SO_2, CH_4
 - 4) N_2O, O_3
- In which pair of ions both the species contains S-S bond?
 - 1) $S_4O_6^{2-}, S_2O_3^{2-}$
 - 2) $S_2O_7^{2-}, S_2O_8^{2-}$
 - 3) $S_4O_6^{2-}, S_2O_7^{2-}$
 - 4) $S_2O_7^{2-}, S_2O_3^{2-}$
- The formation of the oxide ion, $O_{(g)}^{2-}$, from oxygen atom requires first an exothermic and then an endothermic step as shown below:

$$O_{(g)} + e^- \rightarrow O_{(g)}^-; \Delta_f H^\circ = -141 \text{ kJ/mol}$$

$$O_{(g)}^- + e^- \rightarrow O_{(g)}^{2-}; \Delta_f H^\circ = +780 \text{ kJ/mol}$$
 Thus, process of formation of $O_{(g)}^{2-}$ in gas

phase is unfavourable even though O^{2-} is isoelectronic with neon. It is due to the fact that:

- O^- ion has comparatively smaller size than oxygen atom
 - Oxygen is more electronegative
 - Addition of electron in oxygen results in larger size of the ion
 - Electron repulsion outweighs the stability gained by achieving noble gas configuration
26. Which one of the following orders is not in accordance with the property stated against it
- 1) $F_2 > Cl_2 > Br_2 > I_2$: Bond dissociation energy
 - 2) $F_2 > Cl_2 > Br_2 > I_2$: Oxidising power
 - 3) $HI > HBr > HCl > HF$: Acidic property in water
 - 4) $F_2 > Cl_2 > Br_2 > I_2$: Electronegativity
27. ' IF_x ' is in pentagonal bipyramidal in shape. The percentage composition of Iodine in that compound is approximately
- 1) 39
 - 2) 49
 - 3) 51
 - 4) 59
28. Reaction of sodium thiosulphate with iodine gives?
- 1) tetrathionate ion
 - 2) sulphide ion
 - 3) sulphate ion
 - 4) sulphite ion
29. In which of the following molecules are all the bonds are not equal
- 1) NF_3
 - 2) ClF_3
 - 3) BF_3
 - 4) AlF_3
30. Bleaching powder is obtained by the action of chlorine gas and
- 1) dilute solution of $Ca(OH)_2$
 - 2) concentrated solution of $Ca(OH)_2$
 - 3) dry CaO
 - 4) dry slaked lime
31. The most abundant noble gas in atmospheric air is
- 1) He
 - 2) Ar
 - 3) Xe
 - 4) Rn
32. Which of the following pairs has the highest difference in their first ionization energy?
- 1) Xe, Cs
 - 2) Kr, Rb
 - 3) Ar, K
 - 4) Ne, Na
33. Match the compounds give in column I with the hybridisation and shape given in column II and mark the correct option
- | Column I | Column II |
|-------------|-------------------------|
| A) XeF_6 | i) distorted octahedral |
| B) XeO_3 | ii) square planar |
| C) $XeOF_4$ | iii) pyramidal |
| D) XeF_4 | iv) square pyramidal |
- | A | B | C | D | A | B | C | D |
|-------|-----|----|----|-------|----|----|-----|
| 1) iv | iii | i | ii | 2) iv | i | ii | iii |
| 3) i | iii | iv | ii | 4) i | ii | iv | iii |
34. Complete hydrolysis of XeF_4 gives
- 1) XeF_2, Xe
 - 2) $XeOF_2, Xe$
 - 3) XeO_3, Xe
 - 4) $XeO_3, XeOF_2$
35. Which one of the following statements regarding helium is incorrect?
- 1) It is used to fill gas balloons instead of hydrogen because it is lighter and non-inflammable.
 - 2) It is used as a cryogenic agent for carrying out experiments at low temperature
 - 3) It is used to produce and sustain powerful super conducting magnets
 - 4) It is used in gas-cooled nuclear reactors

Answers

1-1; 2-3; 3-2; 4-1; 5-2; 6-3; 7-2; 8-3; 9-2; 10-1; 11-2; 12-3; 13-2; 14-1; 15-4; 16-3; 17-1; 18-1; 19-2; 20-1; 21-3; 22-2; 23-2; 24-1; 25-4; 26-1; 27-2; 28-1; 29-2; 30-4; 31-2; 32-4; 33-3; 34-3; 35-1.

s-Block Elements

- The alkaline earth metal nitrate that does not crystallise with water molecules is?
 - 1) $Sr(NO_3)_2$
 - 2) $Mg(NO_3)_2$
 - 3) $Ca(NO_3)_2$
 - 4) $Ba(NO_3)_2$
- Oxidation number of potassium in K_2O , K_2O_2 and KO_2 respectively is
 - 1) +2, +1 and $+\frac{1}{2}$
 - 2) +1, +1 and +1
 - 3) +1, +4 and +2
 - 4) +1, +2 and +4
- Match the following

List - I	List - II
A) NaOH	i) Baking soda
B) $Na_2CO_3 \cdot 10H_2O$	ii) Caustic soda