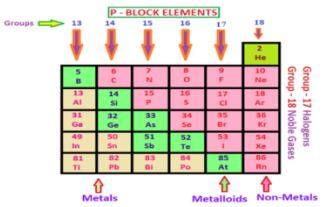
National Institute of Open Schooling
Senior Secondary Course: Chemistry
Chapter- 19: p-block Elements and their Compounds-I
Worksheet-19



1. An organic compound A gives a brick red flame on performing flame test. The compound gives the following tests.

I. It gives smell of chlorine when placed in moist air.

II. If KI and CH_3COOH are added to the solution of the compound a violet color is observed. Identify the compound and write the chemical reactions for the steps (I) and (II).

III. The electron gain enthalpy value of F_2 is less negative than chlorine.

2. Give reasons for each of the following observations

I. Only higher members of the group 18 of the periodic table are expected to form compounds.

II. NO_2 readily forms a dimer whereas ClO_2 doesn't.

3. Give reasons for the following observations

I. SF_6 is used as gaseous electrical insulators.

II. Sulphur exhibit greater tendency for catenation than selenium.

III. The electron gain enthalpy value of F_2 is less negative than chlorine.

4. An element 'A' exists as a yellow solid in standard state. It forms a volatile hydride 'B' which is a foul smelling gas and is extensively used in qualitative analysis of salts. When treated with oxygen, 'B' forms an oxide 'C' which is colorless, pungent smelling gas. This gas when passed through acidified $KMnO_4$ solution decolorizes it. 'C' gets oxidized to another oxide 'D' in the presence of a Heterogeneous catalyst. Identify A, B, C, D and also give the chemical equation of reaction of 'C' with acidified KmnO4 solution and for conversion of 'C' to 'D'.

5. Concentrated sulphuric acid is added followed by heating to each of the following test tubes labelled (i) to (v)

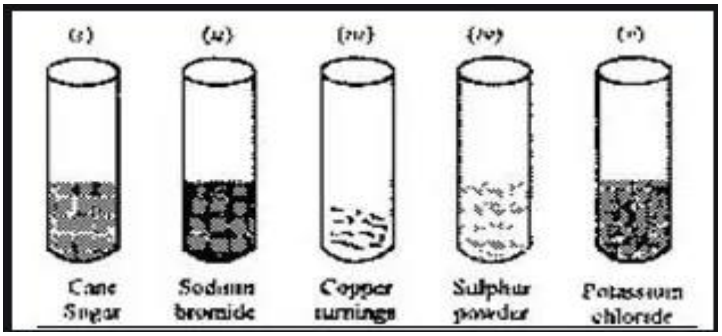


Fig. Identify in which of the above test tube the following change will be observed Support your answer with the help of a chemical equation

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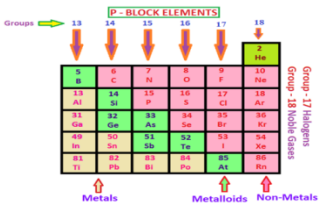

(a) Formation of black substance.
(b) Evolution of brown gas.
(c) Evolution of colorless gas.
(d) Formation of brown substance which on dilution becomes blue.
(e) Disappearance of yellow powder along with evolution of colorless gas.

7. When conc. sulphuric acid was added to an unknown salt present in a test tube, a brown gas (A) was evolved. This gas intensified when copper turnings were also added into this tube. On cooling, the gas 'A' changed into a colourless gas 'B'.
(a) Identify the gases A and B.
(b) Write the equations for the reactions involved.

8. A translucent white waxy solid 'A' on heating in an inert atmosphere is converted in to its allotropic form (B). Allotrope 'A' on reaction with very dilute aqueous KOH liberates a highly poisonous gas 'C' having rotten fish smell. With excess of chlorine 'A' forms 'D' which hydrolysis to compound 'E'. Identify compounds 'A' to 'E'

9. A colorless inorganic salt (A) decomposes completely at about 25^0 C to give only two products, (B) and (C), leaving no residue. The oxide (C) is a liquid at room temperature and neutral to moist litmus paper while the gas (B) is a neutral oxide. White phosphorus burns in excess of (B) to produce a strong white dehydrating agent. Write balanced equations for the reactions involved in the above process. Gradual addition of KI to Bi(NO3)3 solution initially produces a dark brown precipitate which dissolves in excess of KI to give a clear yellow solution. Write chemical equations for the a.

10. Oxides of Nitrogen have open chain structure while those of phosphorous have closed chain or cage structure. Why is it so? Illustrate with one structural example for each type of oxide or the oxides of phosphorous have cage structure but not open ones.