

CBSE TEST PAPER 07

CLASS XI CHEMISTRY (Organic Chemistry Some Basic Principle and Techniques)

General Instruction:

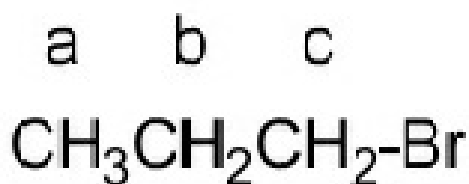
- All questions are compulsory.
 - Marks are given alongwith their questions.
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1. In which C – C bond of $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$, the inductive effect is expected to be the least? [1]
2. Can you use potassium in place of sodium for fusing an organic compound in Lassaigne's test? [1]
3. Give the reason for the fusion of an organic compound with sodium metal for testing nitrogen, sulphur and halogens. [1]
4. 0.395 g of an organic compound by Carius method for the estimation of sulphur gave 0.582 g of BaSO_4 . Calculate the percentage of sulphur in the compound. [3]
5. 0.40g of an organic compound gave 0.3g of Ag Br by Carius method. Find the percentage of bromine in the compound. [3]
6. 0.12g of organic compound containing phosphorus gave 0.22g of $\text{Mg}_2\text{P}_2\text{O}_7$ by the usual analysis. Calculate the percentage of phosphorus in the compound. [3]
7. Ammonia produced when 0.75g of a substance was kjeldahlized, neutralized 30cm^3 of 0.25 N H_2SO_4 . Calculate the percentage of nitrogen in the compound. [3]
8. Write the chemical composition of the compound formed when ferric chloride is added containing both N and S. [1]

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CLASS XI CHEMISTRY (Organic Chemistry Some Basic Principle and Techniques)
[ANSWERS]

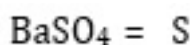
Ans 1. Magnitude of inductive effect diminishes as the number of intervening bonds increases. hence the inductive effect will be least in 'a' carbon.



Ans 2. Lassaigne's test is a test for the detection of halogens, nitrogen and sulphur in an organic compound. Detection of these elements are done after converting them to ionic bond. These elements are bonded together covalently which has to be made into ionic before performing the test, sodium is reactive enough to make them ionic, whereas potassium is too reactive, therefore, potassium(K) can not be used in place of sodium (Na)

Ans 3. In Lassaigne's test, The element present in the compound are converted from covalent form into ionic form by fusing the compound with sodium metal.

Ans 4. Mass of $\text{BaSO}_4 = 0.582\text{g}$



233g of BaSO_4 contain sulphur = 32g

0.582g of BaSO_4 contains sulphur = $\frac{32}{233} \times 0.582$

Percentage of sulphur = $\frac{\text{weight of sulphur}}{\text{weight of compound}} \times 100 =$

=

$$\frac{32}{233} \times \frac{0.582}{0.395} \times 100$$

= 20.24%

Ans 5. Mass of the compound = 0.40g

Now 188g of Ag Br will contain Br = 80g

Therefore, 0.3g of Ag Br will contain Br = $\frac{80}{180} \times 0.3 = 0.127\text{g}$

The percentage of Br in the organic compound

$$= \frac{0.127}{0.40} \times 100 = 31.75\%$$

Ans 6. Here the mass of the compound taken = 0.12g

Mass of $\text{Mg}_2\text{P}_2\text{O}_7$ formed = 0.22g of atoms of P

Now 1 mole of $\text{Mg}_2\text{P}_2\text{O}_7 = (2 \times 24 + 2 \times 31 + 16 \times 7)$

= 222g of $\text{Mg}_2\text{P}_2\text{O}_7$

= 62%

i.e; 222g of $\text{Mg}_2\text{P}_2\text{O}_7$ contain phosphorus = 62g.

\therefore 0.22g of $\text{Mg}_2\text{P}_2\text{O}_7$ will contain phosphorus.

$$= \frac{62}{222} \times 0.22$$

But this is the amount of phosphorus present in 0.12g of organic compound

Hence, percentage of phosphorus

$$= \frac{62}{222} \times \frac{0.22}{0.12} \times 100$$

= 51.20

Ans 7. Mass of organic compound = 0.75g

Volume of H_2SO_4 used us = 30cm^3

Normality of $\text{H}_2\text{SO}_4 = 0.25\text{N}$

30cm^3 of H_2SO_4 of normality 0.25N \equiv 30ml of NH_3 solution of normality 0.25N

But 1000cm^3 of NH_3 of normality 1 contains 14g of nitrogen

$$\therefore 30\text{cm}^3 \text{ of } 0.25\text{N } \text{NH}_3 \text{ contains nitrogen} = \frac{14}{1000} \times 30 \times 0.25$$

$$\% \text{ of nitrogen} = \frac{\text{mass of nitrogen}}{\text{mass of substance}} \times 1000$$

$$= \frac{14}{1000} \times \frac{30 \times 0.25}{0.75} \times 100$$

$$= \underline{\underline{14.00}}.$$

Ans 8. when ferric chloride is added to ionic form of sulphur and nitrogen i.e. sodium thiocyanate, it form red coloured complex known as ferric thiocyanate .

