



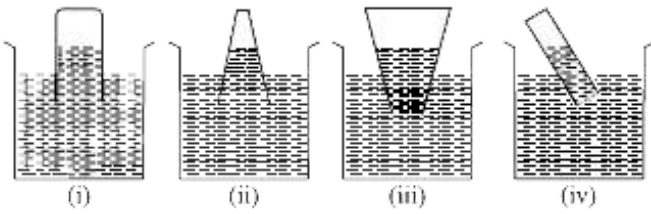
CHEMISTRY

BOOKS - HT Olympiad Previous Year Paper

NSO QUESTION PAPER 2016 SET A

Science

1. The given diagrams show four mercury barometers.



If the value of external pressure in cases (i), (ii), (iii) and (iv) is represented by P_I , P_{II} , P_{III} and P_{IV} respectively, then

A. $P_I > P_{II} = P_{III} > P_{IV}$

B. $P_{IV} > P_{II} = P_{III} > P_I$

C. $P_{III} > P_{II} > P_{IV} > P_I$

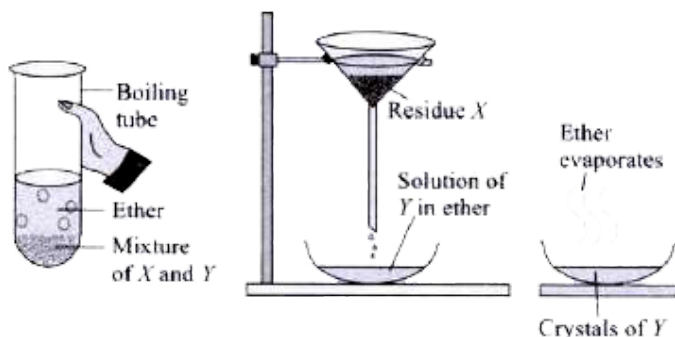
D. $P_I = P_{II} = P_{III} > P_{IV}$

Answer: D





2. The given diagram represents an activity to separate a mixture of two substances X and Y:



Substances X and Y are respectively

- A. Sugar and common salt
- B. Acetone and water
- C. Ammonium chloride and naphthalene

D. Ethyl alcohol and sodium chloride.

Answer: C



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3. Which of the following statements are correct?

(Given: At. wt. of Ca = 40 u, Mg = 24 u, N = 14 u, H = 1u, Na = 23 u, Cl = 35.5 u)

I. 240g of calcium and 240 g of magnesium elements have a molar ratio of 3 : 5.

II. 100 g of N_2 contains more atoms than 100 g of NH_3 .

III. Total number of ions in 5.85 g of sodium chloride is 1.2×10^{22} .

IV. 1 gram molecule of hydrogen gas contains 12.046×10^{23} atoms of hydrogen.

V. 5.6 g of nitrogen gas occupies 3.2 L of volume at STP.

A. II and III only

B. I, II and III only

C. I and IV only

D. IV and V only

Answer: C



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4. Fill in the blanks by choosing an appropriate option. In an oil refinery, crude oil is heated to about 673 K and passed into the (i) . As the vapours rise towards the top, the different hydrocarbons (ii) at different heights and are withdrawn separately. Substance with

(iii) boiling point is collected at the

(iv) of the column.

	(i)	(ii)	(iii)	(iv)
A.	Distillation flask	Condense	Lowest	Top
B.	Chromatographic column	Melt	Highest	Top
C.	Fractionating column	Condense	Highest	Bottom
D.	Fractionating column	Condense	Lowest	Bottom

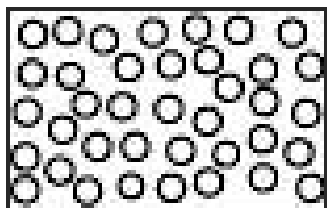


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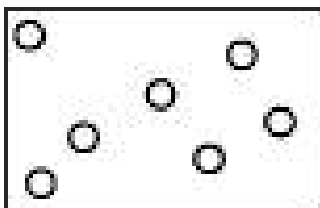
5. The arrangement of particles of an unknown substance at the same pressure at two different temperatures is shown in the

diagrams :

At -140°C



At -100°C



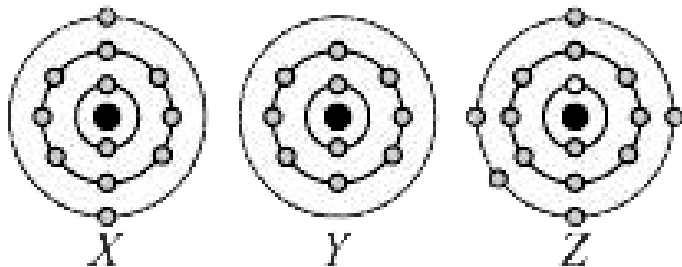
Which of the following substances could the diagrams represent?

Substance	Melting point ($^{\circ}\text{C}$)	Boiling point ($^{\circ}\text{C}$)
A. <i>P</i>	-189	-98
B. <i>Q</i>	-132	-163
C. <i>R</i>	-166	-103
D. <i>S</i>	-115	-86



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6. The schematic atomic structures of three elements X, Y and Z are given as :



Which of the following statements is/are incorrect?

I. Z can form ZCl_3 and ZCl_5 .

II. Y exists in monoatomic form.

III. X and Z combine to form X_3Z type compound.

IV. X and Y combine to form XY_2 type

compound.

V. X will gain two electrons to form a stable compound.

A. I and II only

B. I, II and IV only

C. II, IV and V only

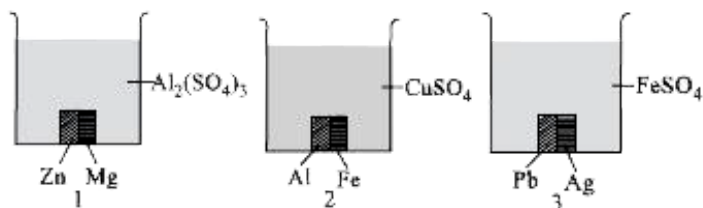
D. III, IV and V only

Answer: D



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7. Observe the given diagram carefully.



Which of the following statements are correct?

I. Both the metal strips will dissolve in beaker

2.

II. Colour of the solution will change in beaker

1.

III. Reaction will take place in beaker 3 but there will be no colour change.

IV. Reaction will occur only in beakers 1 and 2.

A. II and III only

B. I and II only

C. I and IV only

D. All of these

Answer: C



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8. Wax burns with a flame because

A. Liquid wax is vaporised and the vapours of wax burn.

B. Carbon from the wax vaporises to burn.

C. Carbon from the wax combines with oxygen to form carbon dioxide which burns.

D. Hydrogen of the wax burns to form water.

Answer: A



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9. The given table shows the number of protons, neutrons and electrons in atoms or ions. Which atom/ion in the table is an isotope of the atom with the composition of 11 p, 11 e and 14 n ?

Atoms/ Ions	Number of protons (<i>p</i>)	Number of electrons (<i>e</i>)	Number of neutrons (<i>n</i>)
<i>P</i>	11	11	12
<i>Q</i>	18	18	22
<i>R</i>	15	18	16
<i>S</i>	11	10	14

A. P

B. Q

C. R

D. S

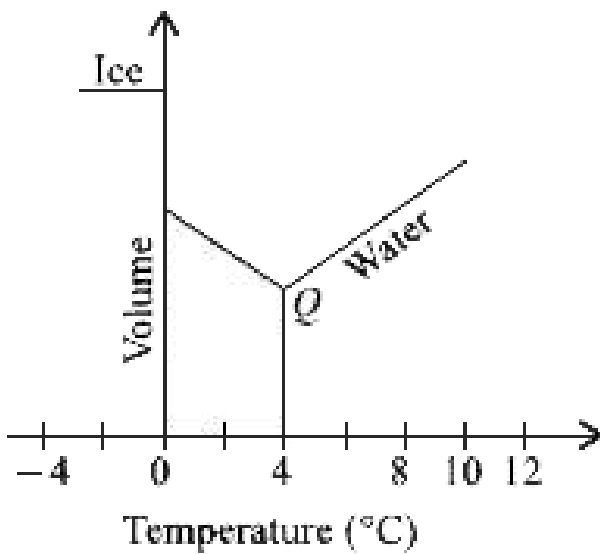
Answer: A



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Achievers Section

1. Study the given graph carefully and select the correct statement(s).



- I. When water is cooled to $4^{\circ}C$, the volume decreases.
- II. Ice and water co-exist at $0^{\circ}C$.
- III. Water has minimum density at point Q.
- IV. The volume of ice is more than that of water.

A. I only

B. II and III only

C. I, II and IV only

D. All of these

Answer: C



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