



CHEMISTRY

BOOKS - PEARSON IIT JEE

FOUNDATION

MYSTERY OF MATTER

Example

1. Two substances X and Y have many free surfaces. They are subjected to heating. After

heating. X is converted to another state which has one free surface and Y is converted to another state which has no free surfaces. Comment on the nature of X and Y.



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2. A solid X floats on water, but sinks in another liquid. And a solid Y floats on water but also floats on another liquid. A solid Z sinks both in water and also in another liquid

Draw a comparison among the densities of X,Y and Z. and justify.



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3. Sodium is a soft metal and chlorine is a gaseous non-metal but sodium chloride is a brittle solid. Give reason.



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Test Your Concepts Very Short Answer Type Question

1. ___ is the process of change of the liquid state into vapour state.



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2. _____ is the temperature at which a liquid starts changing into gaseous state.



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3. The melting point of a solid has the same numerical value as the _____ of the liquid state of the same substance.



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4. The liquids and gases together are called _____



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5. Liquids have definite ____ but no definite _____.



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6. _____ acquires the volume of the container.



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7. _____ is the hardest natural material known.



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8. The process by which a gas changes into its liquid state is called _____ .



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9. Which among the following substances fills up the entire space in the container?

A. Oxygen

B. Water

C. Oil

D. Naphthalene

Answer: A



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10. The condensation point of steam is __

A. $0^{\circ} C$

B. $100^{\circ} C$

C. $120^{\circ} C$

D. $150^{\circ}C$

Answer: B



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11. How many free surface are there in a gas?

A. Many

B. zero

C. One

D. depends on the nature of gas

Answer: B



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12. Identify the conversion associated with decrease in intermolecular forces of attraction.

- A. Steam-water
- B. Water-ice
- C. Dry ice- Carbon dioxide
- D. None of these

Answer: C



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13. Identify a sublimable substance among the following

A. Wax

B. Ice

C. Dry ice

D. Steam

Answer: C



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14. Identify the odd one among the following

A. Potassium permanganate

B. Alum

C. blue vitriol

D. Sand

Answer: D



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15. Identify the gas which is insoluble in water.

A. Oxygen

B. methane

C. carbon dioxide

D. All of these

Answer: B



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16. ___ cannot be broken down into simpler substances.



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17. _____ is the smallest unit of an element.



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18. _____ is a liquid metal.



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19. _____ do not produce sound when struck.



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20. The gaseous elements that do not react chemically with the other elements are known as _____



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21. A _____ is the smallest unit of a compound.



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22. _____ can be heterogeneous or homogenous.



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23. Brass is a homogeneous mixture of _____ and _____.



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24.is the lightest mixture.



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25.and..... are the most abundant elements present in the earth's crust.



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26. Identify the liquid non metal among the following

A. Mercury

B. Iodine

C. Bromine

D. None of these

Answer: C



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27. Which of the following elements is present in trace among in the atmospheric air?

A. Argon

B. Nitrogen

C. Oxygen

D. Ozone

Answer: A



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28. Identify the number of noble gases.

A. 4

B. 6

C. 8

D. 10

Answer: B



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29. Identify the most abundant class of elements.

A. Metals

B. Non metals

C. Metalloids

D. Inert gases

Answer: A



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30. Which among the following elements is abundant in human body?

A. Iron

B. calcium

C. Oxygen

D. Carbon

Answer: D



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31. Identify the metal which is non-malleable.

A. Carbon

B. zinc

C. Lead

D. Platinum

Answer: B



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32. Which among the following is a soft solid and has high melting point?

A. Diamond

B. Sodium

C. chlorine

D. Sulphur

Answer: B



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33. Identify a compound among the following

A. Common salt

B. Air

C. Sugar

D. Diamond

Answer: C



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34. Among the following, which is a metalloid?

A. Antimony

B. carbon

C. Iodine

D. Mercury

Answer: A



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35. The number of naturally found elements in

A. 116

B. 92

C. 100

D. 24

Answer: B



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36. Which of the following liquids can form a single layer when added to water?

A. Alcohol

B. kerosene

C. Petrol

D. Mustard oil

Answer: A



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37. Which of the following types of mixtures is always homogeneous?

A. Liquid -Liquid

B. Gas-gas

C. Solid-Solid

D. Solid-Liquid

Answer: B



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38. Common salt can be separated from the sea water by the method of ___



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39. A mixture of sodium chloride and ammonium chloride can be separated by ____ method.



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40. ____ is the chemical added to water to hasten the process of sedimentation.



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41. An apparatus used for the purpose of centrifugation is called _____ .



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42. In a separating funnel, the _____ liquid forms the upper layer.



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43. The components of ink are separated by



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44. _____ liquids can be separated from their mixtures by the method of distillation.



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45. Solid-solid mixture are mostly_____



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46. Different sized pearls are separated by jewellers by the process of _____ .



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47. Rice grains and husk can be separated by the method of_____.

A. Sieving

B. Hand picking

C. By solvent

D. Winnowing

Answer: D



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48. A mixture of chalk and water can be separated by

A. Sedimentation

B. Filtration

C. Loading

D. Decantation

Answer: B



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49. Centrifugation can be used for the separation of

A. components of ink

B. Sugar from sugar solution

C. Petrol from crude oil

D. Cream from milk

Answer: D



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50. Distilled water cannot be used for which among the following purposes?

A. Drinking

B. Preparation of medicines

C. Preparation of solutions in industries.

D. None of these

Answer: A



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51. Finer clay particles from water can be separated by the process of

A. Sedimentation

B. centrifugation

C. Loading

D. Distillation

Answer: C



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52. The process of pouring out the clear water after setting down of the mud particles is called

A. Sedimentation

B. Decantation

C. Distillation

D. Loading

Answer: B



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53. Identify the mixture in which the constituents cannot be separated by sublimation.

A. Naphthalene+Sand

B. Iodine +Iron

C. Ammonium chloride +Sand

D. Sulphur+sand

Answer: D



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Test Your Concepts Short Answer Type Question

1. Define matter.



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2. What is meant by boiling point?



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3. How do you define interconversion of states of matter?



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4. Give example of substances which undergo sublimation.



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5. Two liquids A and B when mixed together formed two layers. Liquid C when added to B also formed two layers. However, A and C when mixed formed a single layer and also with water. How do you account for this?





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6. Name two opaque liquids.



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7. What is observed when glass and wood are placed in water in two containers? Give reason.



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8. Mention the inter conversions associated with the following phenomena.

Wet clothes are hanged on a string.



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9. Mention the inter conversions associated with the following phenomena.

Appearance of dew drops on the leaves on winter morning.



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10. Mention the inter conversions associated with the following phenomena.

Foggy appearance on a mirror when exhaled air is blown over it.



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11. Mention the inter conversions associated with the following phenomena.

Occurrence of snow fall.



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12. Mention the inter conversions associated with the following phenomena.

Reduction is size of naphthalene balls when placed in a cupboard.



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13. Water plays an important role in the functioning of our body Give reason.



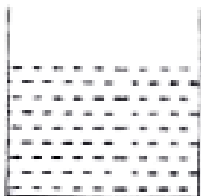
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14. How are animals and plants able to survive in water?

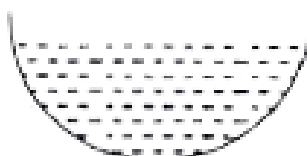


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15. Observe the following figures and draw relevant Conclusion regarding the properties substances represented in the figures.



Oil



Oil

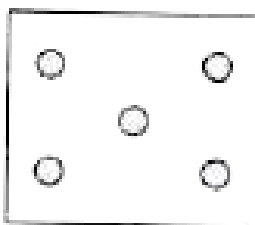


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16. Observe the following figures and draw relevant Conclusion regarding the properties of substances represented in the figures.



Oxygen

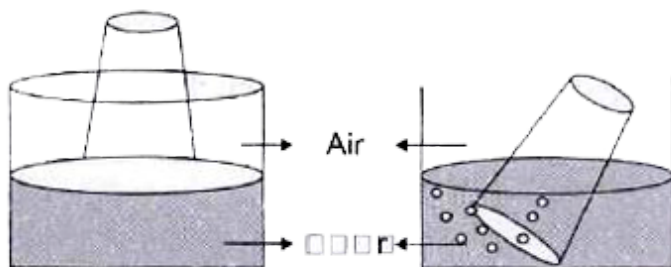


Oxygen



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17. Observe the following figures and draw relevant Conclusion regarding the properties substances represented in the figures.



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18. Give reasons for the following.

Liquids can be taken in an open container

while gas requires a closed container.



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19. Give reasons for the following.

Honey cannot be poured into another container as easily as water.



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20. Give reasons for the following.

Gases flow more than liquids.



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21. Give reasons for the following.

As water is subjected to heating, its temperature increases and become constant at $100^{\circ}C$ even through water is still there in the container and the supply of heat is contained.



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22. Give reasons for the following.

When a solid substance is subjected to heating, it disappears without leaving any liquid.



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23. When you come out of an AC car, foggy appearance is noticed on the spectacles. Give reason.



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24. Hot tea when poured into a saucer facilitates easy drinking. Justify.



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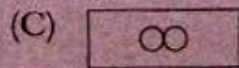
25. Match the following



(i) Elemental molecule



(ii) Elemental atom



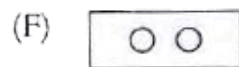
(iii) Mixture of atoms



(iv) Mixture of molecules



(v) Compound of 2 elements



(vi) Compound of 3 elements



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26. Define the following

Element



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27. Define the following

Compound



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28. Define the following

Homogenous mixture



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29. Define the following

Heterogeneous mixture



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30. Define the following

Metalloids



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31. Define the following

Noble gas



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32. Name the gaseous non-metallic elements and the solid non-metallic elements.



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33. Distinguish between metals and non metals with respect to the following characteristics.

Melting and boiling point



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34. Distinguish between metals and non metals with respect to the following characteristics.

Conductivity



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35. Distinguish between metals and non metals with respect to the following characteristics.

Malleability



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36. Name the metalloids.



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37. Distinguish between elements and compounds.



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38. Identify the following

The gaseous compound of two non metals required for photosynthesis.



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39. Identify the following

The compound of two non metals which exists in all the three states under normal conditions.



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40. Identify the following

The metal which breaks into pieces on the application of force.



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41. Identify the following

The metal used in thermometers.



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42. Identify the following

The inert gas used in advertisement sign boards.



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43. X, Y and Z are three substance, On passage of electricity through X, two substances A and B are formed, Y is a liquid which on evaporation generates C as a residue and D was vaporized. Z could not be split up into any simpler substances further. A is found to be a

good conductor of heat and electricity while B was found to be a gas. it is possible to split C and D into simpler substances chemically. what do you infer regarding the nature of these substances with respect to composition?



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44. Sodium chloride is a compound is common salt a compound? Justify.



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45. Identify whether the following are elements or compounds or mixtures. Give proper justification.

Saline water



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46. Identify whether the following are elements or compounds or mixtures. Give proper justification.

Tincture of iodine



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47. Identify whether the following are elements or compounds or mixtures. Give proper justification.

1] Distilled water 2] Potable water



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48. Identify whether the following are elements or compounds or mixtures. Give

proper justification.

Potable water



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49. Identify whether the following are elements or compounds or mixtures. Give proper justification.

Ozone



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50. Identify whether the following are elements or compounds or mixtures. Give proper justification.

Sand



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51. Mention the purposes for which separation of mixtures is important Give examples.



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52. The principle of separation of a mixture depends on which factors?



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53. How does alum hasten the process of sedimentation.



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54. Define the following

Sedimentation



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55. Define the following

Decantation



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56. Define the following

loading



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57. Define the following

Distillation



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58. Define the following

Centrifugation



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59. Explain how it is possible to separate gold from river sand.



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60. Distinguish between residue and filtrate.



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61. Explain the principle involved in centrifugation.



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62. Which method is employed for the separation of constituents from a heterogeneous liquid-liquid mixture? Explain the principle involved.





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63. Explain the process of separation of water and alcohol from their mixture



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64. A mixture of iron filings, saw dust and sugar is available . Explain the methods of separation of these constituents.



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65. Explain the principle involved in the making of coffee decoction.



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Concept Application

1. In which among the following situations evaporation causes cooling is not exploited?

A. We sweat to cool our bodies

B. occurrence of snowfall

C. Stretching out of tongues by dogs
during summer

D. Usage of earthen pots

Answer: B



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2. A mixture contains camphor powder, iron powder and common salt. Identify the

separation methods that are employed to separate the constituents from the mixture.

A. Magnet separation, sublimation ,
addition of water followed by filtration,
evaporation

B. handpicking, sieving , addition of water
followed by filtration, evaporation

C. Magnet separation, sieving, addition of
water followed of filtration , evaporation

D. Magnet separation, sublimation,
sedimentation and decantation,
evaporation

Answer: A



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3. Identify the substances which undergo sublimation.

A. Incense stick and camphor

B. Perfume and dry ice

C. Perfume and incense stick

D. Odonil and dry ice

Answer: D



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4. Identify the false statement among the following

A. Every compound is a pure substance

B. Pure substances are homogeneous in nature

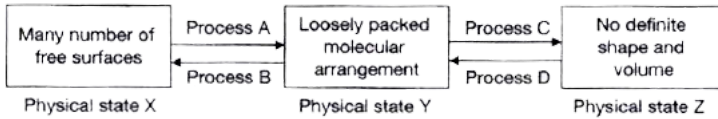
C. Mixtures have fixed composition

D. Formation of compound involves energy change

Answer: C



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5.

Identify the incorrect option from the following based on the diagram given above:

Option	A	B	C	D
(a)	Melting	Freezing	Boiling	Condensation
(b)	Freezing	Melting	Condensation	Boiling
(c)	Boiling	Melting	Freezing	Condensation
(d)	Melting	Condensation	Boiling	Freezing



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Assessment Test Test 1

1. Mention the differences between evaporation and boiling.



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2. An ice cube floats on water. What conclusion can you draw on the basis of this observation?



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3. Identify whether the following statements are true or false and rewrite the false statements.

Vinegar disappears when added to water



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4. Identify whether the following statements are true or false and rewrite the false statements.

Kerosene and petrol form a single layer on mixing



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5. Identify whether the following statements are true or false and rewrite the false statements.

Ground glass is a transparent material



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6. Identify whether the following statements are true or false and rewrite the false statements.

Nitrogen gas is soluble in water



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7. Identify whether the following statements are true or false and rewrite the false statements.

A liquid can have one free surface





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8. Identify whether the following statements are true or false and rewrite the false statements.

Solids have moderate intermolecular forces of attraction



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9. Identify whether the following statements are true or false and rewrite the false

statements.

Condensation is affected by cooling



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10. Write a suitable term for the following description.

The fragrance of incense stick spreads in the entire space enclosed.



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11. Write a suitable term for the following description.

A gas in a larger cylinder can be transferred into a smaller cylinder.



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12. Write a suitable term for the following description.

Naphthalene balls reduce in size on long standing





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13. Write a suitable term for the following description.

Ethyl alcohol on heating starts vaporizing at $78^{\circ}C$



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14. Write a suitable term for the following description.

Liquids and gases can spread to larger distances.



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15. Water is taken in a stainless steel container and heated. Heating is stopped and a lid is placed on the container. What could be your observation?



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16. Identify whether the following sentences are true or false. Also rewrite the false sentences by making suitable corrections.

The constituents of a compound can be separated by physical means,



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17. Identify whether the following sentences are true or false. Also rewrite the false

sentences by making suitable corrections.

Boron is a metal



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18. Identify whether the following sentences are true or false. Also rewrite the false sentences by making suitable corrections.

Xenon is an inert gas



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19. Identify whether the following sentences are true or false. Also rewrite the false sentences by making suitable corrections.

Atom is the smallest unit of a compound.



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20. Identify whether the following sentences are true or false. Also rewrite the false sentences by making suitable corrections.

Aluminium is the most abundant non metal in the earth crust.



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21. Write the suitable terms corresponding to the description given below.

The ability of a material to be beaten into thin foils.



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22. Write the suitable terms corresponding to the description given below.

The tendency of a material to produce loud ringing sound.



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23. Write the suitable terms corresponding to the description given below.

The ability of silver to be drawn into thin wires.





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24. Write the suitable terms corresponding to the description given below.

The nature of a substance where the distribution of the different kinds of molecules is not uniform



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25. Write the suitable terms corresponding to the description given below.

A substance in which the constituents can be separated by physical method.



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26. Classify the following into elements, compounds and mixtures.

Nitrogen, Carbon dioxide, sand, washing soda, fruit juice, soda water, mercury, concrete, argon, saline water, bromine and sugar.



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27. Complete the given table

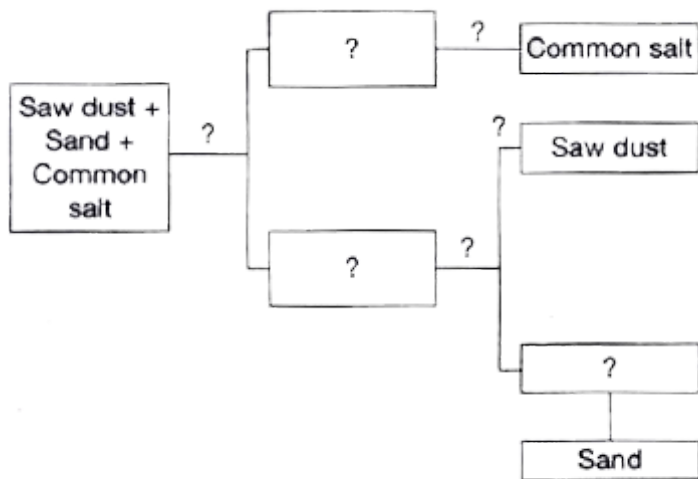
State	Sonorous- ness	Lustre	Brittleness
Sulphur			
Copper			



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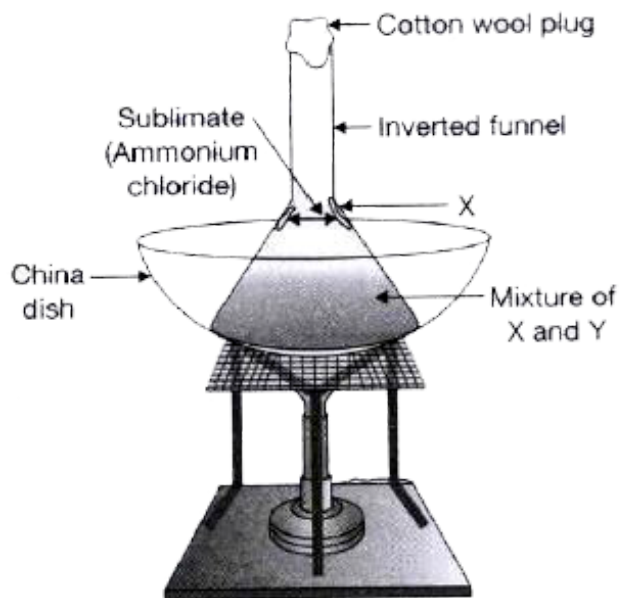
28. Observe the following chart and fill in the blanks with suitable process of separation and constituents of mixtures for the given

reaction.



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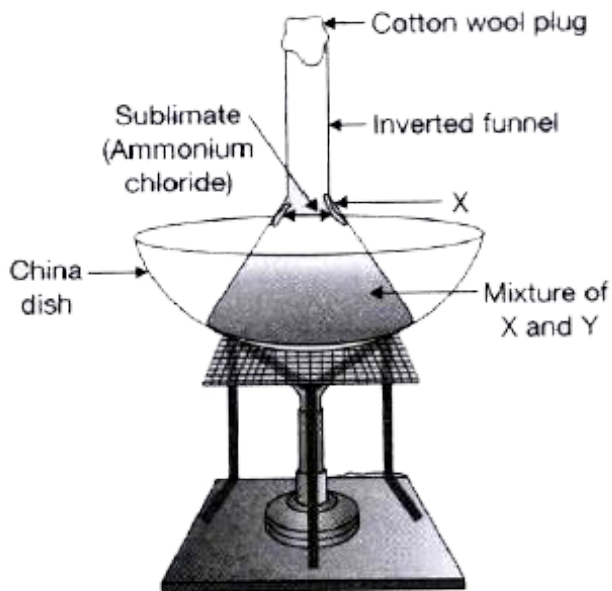
29. Which method of separation is indicated in the above figure



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30. A mixture of two components X and Y. X is an element and Y is a compound of two non

metals. Identify X and Y.



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31. Is vapour and gas same? Why?



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32. Why is a diver able to cut through water in a swimming pool



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33. Why ice floats on water?



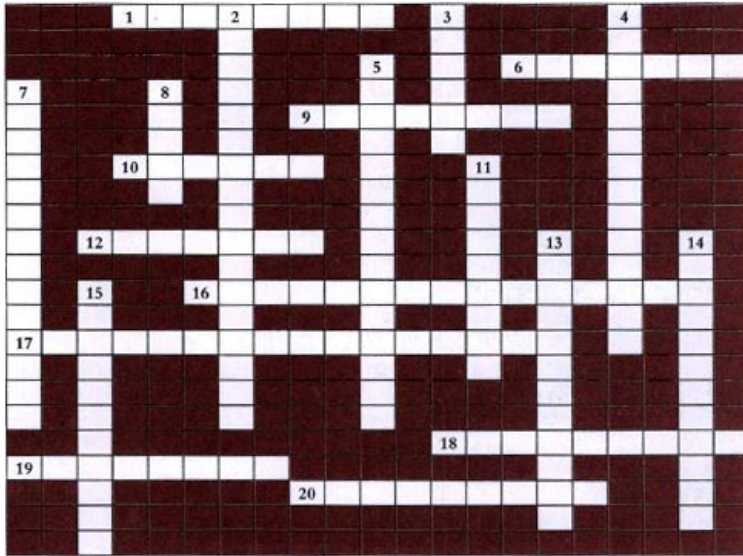
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34. You are provided with a mixture of salt, sand, oil and water. Write the steps involved for the separation of salt, sand and oil from the mixture.



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Crossword



1.

Across

1. An example for metalloid
6. Heaviest element
9. Elements in definite proportion
10. An example for solid non-metal
12. Molecule made up of similar atoms
16. Kerosene and petrol

17. Sublimable substance

18. Property of a material to be drawn into thin wires

19. Conversion of liquid to solid

20. Material used for filtration

Down

2. Groundnut oil and alcohol

3. Conversion of solid to liquid

4. Rotation of mixture at high speed 5.

Property of gases

7. Separation of coloured pigments

8. An example for inert gas

11. Properties of metals and non-metals

13. Conversion of gas into liquid

14. Difference in boiling points of liquids

15. Nature of gas in liquid mixtures



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