SAFALTA CLASS An Initiative by 3147.3511CT

- 1. Name the particles which make up matter?
- A. Non metals
- **B.** Metals
- C. Metalloids



- 2. Which of the following is the property of Solid?
- A. Can be compressed
- B. Have definite shape
- C. Have low density

D. Intermolecular force is less

3. The process in which heat is required to convert a liquid into the vapour state is known as:

A. Evaporation

B. Latent heat of Vaporisation

C. Melting

D. Condensation

- 4. Which of the following is a property of diffusion?
- A. Slowest in liquids
- B. Fastest in gases
- C. Based on motion of particles

D. All of the above

- 5. By which technique salt is obtained from sea-water?
- A. Filtration
- **B. Distillation**
- C. Evaporation
- D. Chromatography

6. Diffusion in liquids is an example of:

- A. Smell of perfume
- B. Smell of food
- C. Spreading of ink in water
- D. Fragrance of incense stick

7. When a beaker of water is heated its volume increases a little. What is happening to the particles in the liquid?

1.They are moving faster

2. They are moving slower.

3. They are getting bigger.

4. They are getting smaller.



8. Which one of the following is not a property of gases?

A. They have no definite shape.

B. They can diffuse.

C. They have a definite mass.

D. They have a definite volume.

Classifying Matter: Blements, de - Compounds, and » Mixtures States



तत्व, यौगिक और मिश्रण

Pure Substance & mixture







• पदार्थ का एक नमूना जिसमें निश्चित रासायनिक और भौतिक गुण होते हैं।







$$H - H = H_2$$

$$O - O = D_2$$

$$N - N = H_2$$

$$M - N = H_2$$

• शुद्ध पदार्थ जिसे भौतिक या रासायनिक साधनों द्वारा सरल पदार्थ में अलग नहीं किया जा सकता है।

तत्व

1 2	Periodic Table								VIA ⁸ O	VIIA ⁹ F	0 2 He 10 Ne							
з	¹¹ Na	12 Mg	шв	IVB	VB	VIB	VIIB		- 111 -		IB	IIB	¹³ Al	¹⁴ Si	¹⁵ P	¹⁶ S	¹⁷ CI	¹⁸ Ar
4	¹⁹ K	20 Ca	21 Sc	22 Ti	²³ V	²⁴ Cr	²⁵ Mn	²⁶ Fe	27 Co	28 Ni	29 Cu	30 Zn	Ga	Ge	³³ As	³⁴ Se	³⁵ Br	³⁶ Kr
5	³⁷ Rb	³⁸ Sr	³⁹ Y	⁴⁰ Zr	⁴¹ Nb	42 Mo	43 Tc	Ru	⁴⁵ Rh	Pd	47 Ag	⁴⁸ Cd	49 In	50 Sn	51 Sb	52 Te	53 	⁵⁴ Xe
6	Cs	56 Ba	57 *La	72 Hf	73 Ta	⁷⁴	75 Re	76 Os	77 Ir	78 Pt	79 Au	⁸⁰ Hg	81 TI	⁸² Pb	83 Bi	⁸⁴ Po	⁸⁵ At	⁸⁶ Rn
7	87 Fr	⁸⁸ Ra	89 +Ac	¹⁰⁴ Rf	¹⁰⁵ Ha	¹⁰⁶ Sg	¹⁰⁷ Ns	¹⁰⁸ Hs	¹⁰⁹ Mt	110 110	¹¹¹ 111	¹¹² 112	¹¹³ 113					
*	Lanth Series	anide s	Се	Pr	Ňd	Pm	°² Sm	Eu	Ğd	°°ть	Ъу	Йο	Er	Tm	҈ҮҌ	Lu		
+	Actini Series	de s	⁹⁰ Th	⁹¹ Pa	92 U	93 Np	Pu	⁹⁵ Am	⁹⁶ Cm	⁹⁷ Bk	⁹⁸ Cf	⁹⁹ Es	Fm	¹⁰¹ Md	¹⁰² No	¹⁰³ Lr		

Hz+0 -> Compounds (21 forth) 2 JI 2 A wattat > Diff. element Mad. 12+0 > H20> 17 Broh

Pure substance composed of two or more different elements joined by chemical bonds.

- Made of elements in a specific ratio that is always the same
- Has a chemical formula
- Can only be separated by chemical means, not physically,



- दो या दो से अधिक विभिन्न तत्वों से बना शुद्ध पदार्थ रासायनिक बंधों से जुड़ता है।
- एक विशिष्ट अनुपात में तत्वों से बना
 वह हमेशा एक ही है
- रासायनिक सूत्र है
- रासायनिक प्रतिक्रिया द्वारा ही अलग किया जा सकता है
- रासायनिक का मतलब है, भौतिक रूप से नहीं



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Ca

Ρ

Minerals

6%





Mg 16% 1% Carbohydrate

Fat

Chlorine 0.2% Magnesium 0,1%

Other >1%





- A combination of two or more <u>pure</u> <u>substances</u> that are not chemically combined·
- substances held together by physical forces, not chemical
- No chemical change takes place
- Each item retains its properties in the <u>mixture</u>
- They can be separated physically





मिश्रण

• दो या दो से अधिक शुद्ध पदार्थों का संयोजन जो रासायनिक रूप से संयुक्त नहीं हैं।

- भौतिक बलों द्वारा एक साथ रखे गए पदार्थ, रासायनिक नहीं कोई रासायनिक परिवर्तन नहीं होता है
- प्रत्येक आइटम अपने गुणों को बरकरार रखता है
- मिश्रण में उन्हें भौतिक रूप से अलग किया जा सकता है

What Is A Mixture?

A mixture is made of **2** or more types of atoms that are **NOT** chemically combined together.



Mixtures can take many forms:



Mixtures of Solids



Mixtures of Liquids



Mixtures of Gases





2. Types of Mixtures

Mixtures can also be grouped

i) on the basis of their physical states:

	SOLID		GAS						
SOLID	 Salt and sugar 	• Salt and water	• Dust in air						
LIQUID	 Mercury and copper 	Alcohol and water	• Clouds						
GAS	 Hydrogen and palladium 	 Oxygen and water 	• <u>Air</u>						
ii) on the basis of miscibility:									
Homog	eneous Mixture २२ मा २१	Heterogeneous Mixture	(9-03-41)						
•	It consists of single phase.	 It consists of two or more phase. 							
•	Uniform composition.	 Does not have uniformation 	 Does not have uniform composition. 						

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Example: Air, sand and common salt.

• Example: Sugar dissolved in water



मिश्रण वह अशुद्ध पदार्थ है जो दो या दो से अधिक शुद्ध पदार्थीं (तत्व या यौगिक या दोनों) के किसी भी अनुपात में बिना रासायनिक संयोग के मिलने से बनता है तथा जिसके अवयवी पदार्थीं को सरल यांत्रिक या भौतिक विधियों द्वारा अलग-अलग किया जा सकता है।

उदाहरण के लिए **वायु अनेक गैसों का मिश्रण है।** वायु में ऑक्सीजन, कार्बन डाइऑक्साइड, जलवाष्प प्रमुख हैं।

मिश्रण के प्रकार

मिश्रण के अवयव पदार्थों की प्रकृति तथा उनसे बने मिश्रण के गुण एवं संगठन के आधार पर इसे दो मुख्य प्रकारों में विभाजित किया जाता है।

1. समांगी मिश्रण

मिश्रण जिसके प्रत्येक भाग में उसके अवयवी पदार्थों का संगठन एवं गुण सामान रहता है समांगी मिश्रण कहलाता है। चीनी का जल में विलियन, नमक का जल में घोल, अमोनिया गैस का हवा में विलियन आदि इसके उदाहरण हैं।

2. असमांगी मिश्रण

वह मिश्रण जिस के विभिन्न भागों में उसके अवयवी पदार्थों का संगठन एवं गुण एक समान नहीं होते असमांगी मिश्रण कहलाता है। लोहा एवं गंधक, बालू एवं नमक, खड़िया का जल में, धूल कणों का हवा में मिश्रण आदि असमांगी मिश्रण के उदाहरण हैं। सामान्यतः एक असमांगी मिश्रण के अवयव पदार्थों को एक-दूसरे से अलग करना एक समांगी मिश्रण की तुलना में अधिक आसान होता है।

Types Of Mixtures

There are 2 major types of mixtures:



Heterogeneous Mixtures







Which Kind of Mixture?

Classify each type of mixture as:





4. Separating the components of a mixture

The components of a heterogeneous mixture can be separated by

simple methods like -

hand picking , sieving , & Winnowing

special techniques like -

i) Evaporation : a mixture of salt and water or sugar and water.

ii) Centrifugation : Butter from curd, Fine mud particles suspended in water. jii) Decantation (Using separating funnel) : Oil from water.

L, Physical

Jiv) Sublimation: Camphor from salt,

v) Chromatography : Different pigments from an extract of flower petals. vi) Distillation and fractional distillation : Separating components of Petroleum viii) Magnetic separation: Iron pins from sand.

Can you identify the following?

You will be shown a series of photos. Tell if each photo represents an item composed of an element, compound, or mixture.

Review:

- An **element** contains just one type of atom.
- A **compound** contains two or <u>more</u> different atoms joined together.
- A **mixture** contains two or more different substances that are only physically joined together, not chemically.
 - A mixture can contain both elements and compounds.






Copper

Cu



Element, Compound, or Mixture? Jelly Beans



Element, Compound, or Mixture? Jelly Beans



Element, Compound, or Mixture? Table Sugar



Table Sugar

 $C_{12}H_{22}O_{11}$



Element, Compound, or Mixture? Diamond



Element, Compound, or Mixture? Diamond









Element, Compound, or Mixture? NaCl Salt



Element, Compound, or Mixture? Neon Gas



Element, Compound, or Mixture? Neon Gas







Element, Compound, or Mixture? Pure Water



Element, Compound, or Mixture? Pure Water H2' 50 E

Element, Compound, or Mixture? Aluminum



Aluminum



Lemonade



Lemonade





Ag

Silver







द्रव्य का वगीकरण (Classification of Matter) Chart



classes of MIXTURES

	Solution	Colloid	Suspension
Examples	salt w <u>a</u> ter, air	Soot, fog, mayonnaise	Muddy water, Italian dressing
Particle Type	ions, atoms	Small Clusters	Large Clusters
Particle Size	small	medium	large ≁
Scatter Light? (TYNDALL EFFECT)	No	yes	yes
Settle while standing?	No	No	yes
Separate by filtration?	No	No	yes

Homogeneus mixtures (Sacuta => + HAISTI ()

Homogeneous mixtures : is a mixture in which the components are evenly distributed among each other. You can't see the component parts. Homo means the same throughout. It has a constant composition throughout. • Homogenous mixtures are also called SOLUTIONS

Examples: Salt dissolved in water, sugar dissolved in water, apple juice, tea, copper (II) sulfate solution in water, alloys....

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C Copper(II) sulfate (CuSO₄) in water, a homogeneous mixture (solution)

Solutions



- Well-mixed (uniform) single phase
- homogeneous 🖉
- transparent
- cannot be separated by filter ψ
- do not separate on standing



States of matter in solution	Example of solutions	
gas in gas	air (N_2 , O_2 , Ar, CO_2 , other gases)	
gas in liquid	soda pop (CO ₂ in water)	
liquid in liquid	gasoline (a mixture of hydrocarbon compounds)	
solid in liquid	Filtrated sea water (NaCl and other salts in water)	
gas in solid	H ₂ in platinum or palladium	
liquid in solid	dental amalgams (mercury in silver)	
solid in solid	alloys (brass, (Cu/Zn), sol- der (Sn/Pb), Steel (Fe/C))	

Solutions

• A **solution** is a special type of mixture.

•A solution is a <u>homogeneous mixture</u> that combines a <u>solute</u> and a <u>solvent</u>.

> A solution involves one substance dissolving in another substance, which is usually a liquid.



Solutions



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How To Make A Solution





• We can **measure** how **easily** a solute will dissolve in a certain solvent.

• This measurement is called solubility.



The solute dissolves quickly & easily

e.g. salt in water

LOW Solubility

The solute does not dissolve easily

e.g. <u>sand</u> in water

Dilute vs. Concentrated

• We can add a LITTLE or a LOT of solute!

For example, putting spoonfuls of sugar into a cup of tea...



A solution with only a **small amount** of <u>solute</u> is called a **dilute** solution.





Dilute vs. Concentrated

• We can add a LITTLE or a LOT of solute!

For example, putting spoonfuls of sugar into a cup of tea...



A solution with a **large amount** of solute is called **concentrated**.







Eventually, a solvent can't hold anymore!



A <u>saturated solution</u> CANNOT hold any more solute at a <u>certain temperature</u>.





But, by heating a solvent up, we can make it hold even more solute than normal.

A <u>super-saturated</u> solution contains more solute than it can normally dissolve.



- **<u>Heterogeneous mixture</u>**: the components are not evenly
- distributed among each other. An heterogeneous
- mixture has two or more distinct phases that are usually detectable. This type of mixture does NOT have uniform
- detectable. This type of mixture does NOT have uniform properties.
- Heterogeneous mixtures that look like solutions can be
- distinguished because they scatter light (Tyndall effect).
- **Examples:** Sand water, oil and water, milk, sulfur and iron, granite, blood...



A Granite, a heterogeneous mixture



B Human blood, a heterogeneous mixture



• समांगी (Homogeneous) तथा विषमांगी (Heterogeneous mixture) मिश्रणों के बीच के गुण वाला एक मिश्रण जिसके कण विलयन में समान रूप से फैले होते हैं, कोलाइडल विलयन कहलाते है

कोलाइड के गुण (PROPERTIES OF A COLLOID)

- कोलाइड एक विषमांगी (HETEROGENEOUS)मिश्रण है.

- कोलाइड के कण इतने बड़े होते हैं कि वे प्रकाश को फैला देते हैं, जिससे प्रकाश का मार्ग दृष्टिगोचर हो जाता है.

- कोलाइडी विलयन को शांत छोड़ देने पर इसके कण तल पर नहीं बैठते हैं, अर्थात ये स्थाई होते हैं.

- कोलाइड के कणों को छानन विधि द्वारा पृथक नहीं किया जा सकता परंतु एक विशेष विधि अपकेन्द्रीकरण तकनीक (CENTRIFUGAL TECHNIQUE) द्वारा इन्हें पृथक किया जा सकता है.



non transparent, non uniform, large particles, cloudy (milky)

but stable system

Suspensions

- A suspension of liquid droplets or fine solid particles in a gas is called an <u>aerosol</u>. In the <u>atmosphere</u> these consist of fine dust and <u>soot</u> particles, and <u>cloud</u> droplets.
- suspension: system does not stays stable and settle
- Examples of Suspensions
 - <u>Mud</u> or muddy water, is where <u>soil</u>, <u>clay</u>, or <u>silt</u> particles are suspended in water.
 - Flour suspended in water.
 - <u>Paint</u>
 - Chalk powder suspended in water.
 - <u>Dust</u> particles suspended in air.
 - <u>Algae</u> in water
 - <u>Milk of Magnesia</u>



Tyndall effect:

You can see the light passes through a colloid or suspension. (particles scatter light.)

emulsion: a mixture of immiscible substances (liquid-liquid). द्व (प्रायसन) like milk and mayonnaise

[Which of the following will show the Tyndall Effect]

- XA. [water]
- **X** B. [sugar water]
- **X** C. [oxygen gas]
- 🗸 D. [fog]

[Which of the following is a colloid]

- 🗸 A. [milk]
- **X** B. [NaCl in water]
- C. [sand and water]
- D. [raisin bread]



www.Youtube.com/safaltaclass



www.Facebook.com/safaltaclass



www.Instagram.com/safaltaclass



