

- ① (A) NB Usually for a Q which asks "explain the difference", you simply define both terms (not an actual answer to the Q) but it is what people accept)
- so • A physical change does not break or form chemical bonds and is considered reversible
- A chemical change does break and/or form chemical bonds and is considered non-reversible.
- examples - Physical - cutting timber, melting ice
Chemical - burning timber, cooking.

(B) There are 4 indicators of chemical change.

- temperature increase or decrease
- change in colour
- formation of a gas (bubbles form)
- formation of a solid (a precipitate)

If any one "indicator" occurs = chemical change. If no "indicators" occur, = physical change.

② See periodic table.

- ③ • Atom - smallest particle of matter (that retains the properties of that matter) (eg) oxygen atom, Hydrogen atom, etc.
- Element - composed of only one type of atom.
(eg) Oxygen gas (O_2), gold (Au) etc
 - Compound - composed of two or more elements (types of atoms) chemically bonded together
(eg) H_2O - water, NaCl - salt etc
 - Mixture - composed of two or more pure substances NOT chemically bonded together. eg milk, muddy water, tea etc.

- Molecule - two or more atoms chemically bonded together. eg N_2 , MgO , H_2SO_4 etc.

- ④
- a) O
 - b) $\Delta-O$ or $\triangleleft O$
 - c) $\square-\square$ or $\square\square$ any shape with 2 or more $\square$'s joined
 - d) $\Delta-O$ or any shape with more Δ 's and O 's joined

- ⑤ (a) Compound, CH_4 . This has two elements chemically joined together (C and H) = compound.
- (b) Molecule. There is two or more (5 in total) atoms chemically bonded together
- (c) Pure Substance. Only one substance shown, and it has a definite proportion ($1 \times C$, $4 \times H$)
- (d) CH_4

- ⑥ • Metals are on the left and centre of the P.T
eg - any 3 Cu , Mg , Fe
- Non-Metals are on the right of the periodic table
eg - any 3 O , N , F

- ⑦ Some elements are known by ancient names (as they were discovered many years ago). Their symbol is derived from this ancient name
eg Gold = Aurum = Au and Iron = Ferrum = Fe

- ⑧ (a) (i) Nitrogen and Hydrogen
(ii) Carbon, Hydrogen, and Oxygen.
- (b) Cane Sugar
- (c) Alcohol, Cane Sugar, Carbon dioxide
- (d) 9 (3 molecules, each with 3 oxygen atoms)
- (e) Sodium Chloride

⑧ (f) Cane Sugar has the highest number of H atoms at 22.
But H atoms make up 3 out of 4 atoms in NH_3 , making
Hydrogen 75% of NH_3 . Either answer could be correct

- ⑨ (a) I (d) IV
(b) III (e) VI
(c) V (f) II

⑩ See answer to ⑩1, part B.

⑪

FEATURE	SOLUTION	COLLOID	SUSPENSION
Particle Size	molecular	microscopic	macroscopic
Can particles be seen?	no	no	yes
Light pass through, or scattered?	pass	scattered	scattered
Transparent, translucent, opaque?	Transparent	Translucent or opaque	Translucent or opaque
Can be filtered out?	no	no	yes
Separate into layers?	no	no	yes
Examples	tea	milk	muddy water

⑫ Properties suitable for a skateboard deck.

- strength
- low flexibility (but not zero)
- Durable (not wear easily)
- low density (not weight a lot)

Two most important =

1st - strength. The skateboard has to support the weight of the rider so needs to stay rigid and not bend too much when ridden.

2nd - Could vary. There are good arguments for each of the other properties.