Physical and Chemical Properties – Physical and Chemical Changes

Physical Properties

- are features of matter which can observed or measured without changing the composition
- are used to observe or describe matter

McRae physical properties--how I look!

red hair old white green eyes short female

Examples of Properties of Matter

Property	Info/Examples	Property	Info/Examples
State of matter	S, L, G	Density	1g/1mL=H_2O
Colour	colourless, white etc	Malleability	→ sheets=m=Al foil
Smell	rotten egg, weigh	Ductility	→ wires=m=Cu
Taste	salty, sweet, sour	Solubility	salt water / sugar water
Texture	furry, rough	Conductivity	metals / ABS solids
Melting point	0°C H_2O	Boiling point	100°C water
Ferro-magnetism	Fe, Ni, Co		

Physical Changes

- a physical change takes place without any changes in molecular composition
- the same element or compound is present before and after the change
- physical changes are related to physical properties since some measurements require that changes be made
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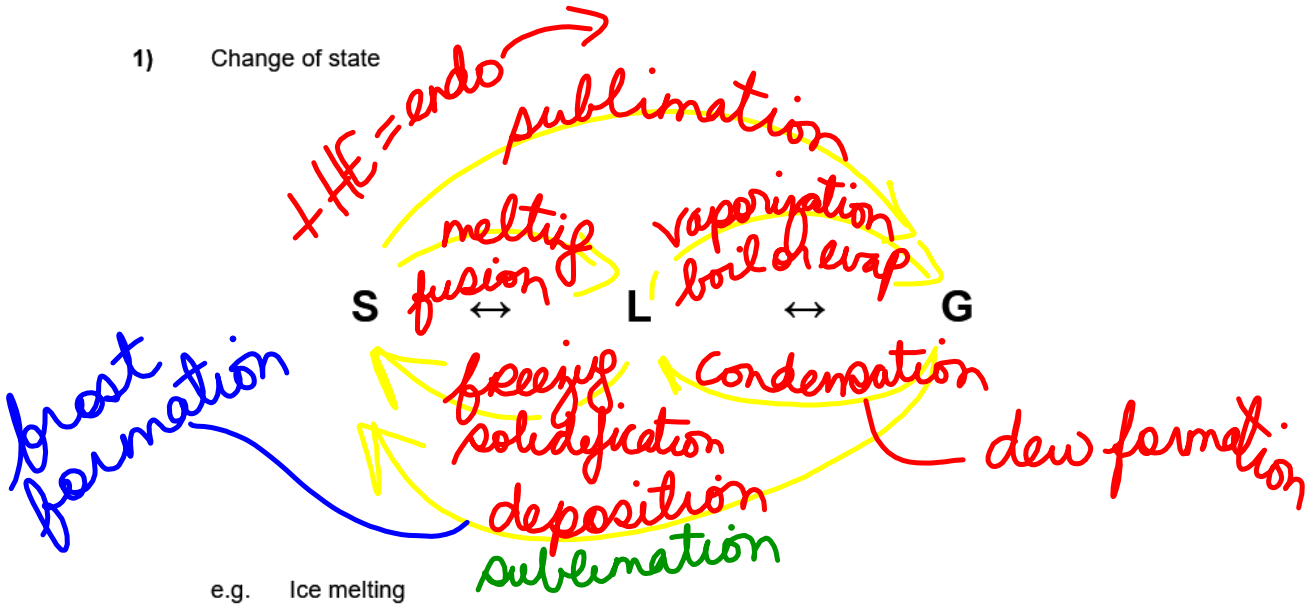
- the appearance may change but you still have the same substance as before
- can be easily reversed

Examples of Physical Changes

1) Change of state



e.g. Ice melting

$H_2O(s) + HE \rightarrow H_2O(l)$

e.g. Dry ice subliming

$CO_2(s) + HE \rightarrow CO_2(g)$

2) Dissolving = mix = homogeneous mix = soln

eg sugar in water

eg O_2 in N_2 (air)

solute solvent

3) Trauma

crumpled paper, crushed stone

Characteristic Physical Properties

- a feature of matter that is specific to the substance--can be used to identify the sub.

McRae characteristic physical properties

e.g. fingerprints, dental records, retinal pattern

Chemical Properties

- how one chemical reacts with another chemical
- you have to see the chemical "in action" to determine

McRae chemical properties--how I behave! (act = react)

mean, loud, "crazy"

Property	Info/Examples	Property	Info/Examples
acidic	vinegar		
rusting	iron chair		
not rusting	gold ring		

Characteristic Chemical Properties

- a feature of matter that is specific to the substance--can be used to identify the sub.

McRae characteristic chemical properties

e.g.

DNA! = a chemical

Chemical Changes

- always result in new substances--completely different that the substance you started with
- the physical appearance changes and you have different substances than what you had before
- both physical and chemical properties may change
- the atoms rearrange and form new substances
- **some** chemical changes are difficult if not impossible to reverse

Signs of Chemical Change

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