

The Properties of Matter

Matter is anything that has *mass*.

Mass: the property of a body that causes it to have weight in a gravitational field (mass = the *amount of matter* in an object).

Volume: the amount of *3-dimensional space* that an object takes up.

Energy: the ability to do work (chemical, light, heat, nuclear ...)

There are two types of matter

1. Living Matter: (Plants, Animals, Bacteria ...)
2. Non -Living Matter: (Rocks, Plastic, Water ...)

Qualitative Property: is a characteristic of a substance that can be described but not measured.

Taste



Smell

Hearing



Sight

Touch



You use your five senses to make *qualitative* observations.

You can describe matter using the following terms. Since qualitative properties are not specific or characteristic to any type of matter, the more terms you use to describe a substance the better.

To describe all substances:

clarity - transparent (clear), translucent (cloudy), opaque

colour - colourless, red, orange, blue, white, etc

odour - odourless, sweet, sour, burnt, aromatic, fragrant, nauseating, sharp, acrid, choking

To describe solids only:

texture - crystalline, granular, waxy, flaky

lustre - shiny, dull, metallic, greasy, glassy

hardness - hard, soft, flexible, brittle

To describe liquids only: viscosity

Quantitative Property: is a characteristic of a substance that can be measured numerically.

A measurement *always* consists of:

a number or value

an estimate of the last digit

a unit of measure



Physical Properties: are the properties that do not involve the making of new substances.

Physical Properties are things like ...

Colour

Lustre

Texture

Density

Shape

Transmission of Light

Hardness

Clarity (transparent/opaque)

Odour

Taste

Melting point

State (solid/liquid/gas)

Boiling Point

Hardness: the measure of the resistance of a solid to being scratched or dented

Melting Point : temperature which the solid form of a substance becomes liquid

Boiling Point : temperature which the liquid form of a substance becomes a gas

Solubility : the ability of a substance to dissolve in a solvent like water

Viscosity: the measure of how easily a liquid substance flows.
(the thicker the liquid the more viscous it is)

Characteristic Physical Properties:

The physical properties of a substance that make that substance different from most other substances are called the characteristic physical properties of that substance. Things boiling point, melting point and density are all characteristic physical properties.

Chemical Properties: are the properties that involve the formation of a new substance. (example: when iron rusts or propane burns)

Chemical Properties are things like ...

- **Combustibility:** the ability of a substance to burn (requires oxygen)
- **Flammable:** the ability of a substance to burn when exposed to a flame
- **Light Sensitivity:** the ability of a substance to change to a new substance in the presence of visible light
- **Corrosion , Bleaching Ability , Reaction of an Acid with a Base**

HMWK: Pg 177 State FIVE evidences of a chemical CHANGE . . .; question on lab exam
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