www.expertguidance.co.uk
mahima.laroyia@expertguidance.co.uk
+447448352272

METALLIC BONDING

Ionic Bonding

Covalent Bonding

Metallic Bonding

State of Matter

Ionic compounds

Covalent Compounds

Diamond and Graphite

Nanoparticles

Graphere and Fullerene

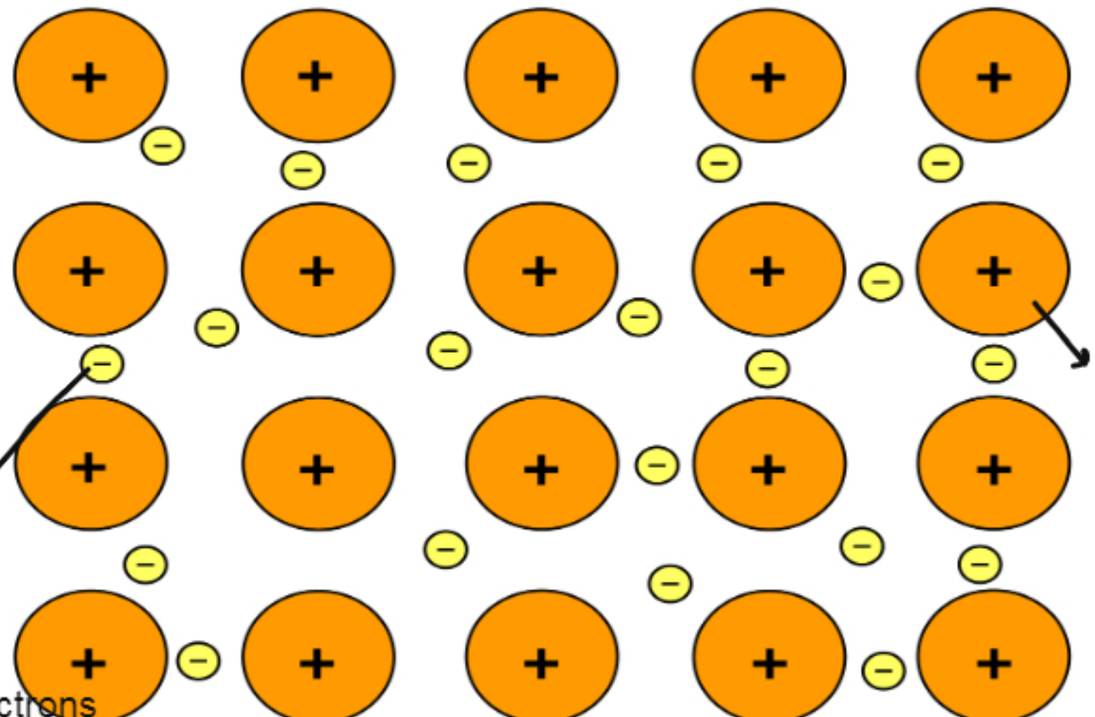
METALLIC BONDING !!!!

It is between two metals.

There are fixed positive ions present in the sea of delocalised electrons.

There is strong electrostatic force of attraction between fixed positive ions and delocalized electrons resulting in metallic bonding.

Layered structure



www.expertguidance.co.uk
mahima.laroyia@expertguidance.co.uk
+447448352272

Source: Wikimedia Commons

Metals are malleable

Malleable means that the metals can be hammered into any shape.

Metals have layered structure and layers can slide past each other by hammering giving metals different shapes.

Metals are ductile

Ductile means that the metals can be drawn into thin wires.

Metals have layered structure and layers can slide past each other by hammering giving metals a wire shape.

Metallic Bonding

Atoms in a metal are arranged in a regular manner and vibrate about fixed positions.

The outermost electrons move freely, forming a '**sea of electrons**' enveloping the positive metal ions.

Source: Flickr.com

Metals are good conductors of electricity

Metals have delocalised electrons.

They are mobile and conduct electricity.

These mobile electrons or delocalised electrons conduct heat and electricity.

Metals have high melting and boiling points

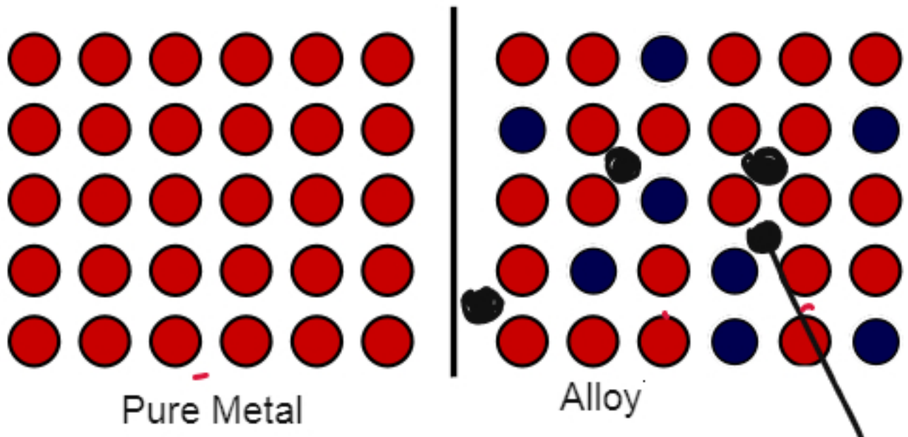
There is strong electrostatic force of attraction between fixed positive ions and delocalized electrons.

Large amount of energy is required to overcome strong electrostatic force of attraction.

www.expertguidance.co.u
mahima.laroyia@expertgu
+447448352272

ALLOYS

Alloys are the mixture of metals with another metal or a non metal which make the metal stronger.



Example: Steel is the alloy of iron which is more strong and resistant to corrossion.

In metals the particles are arrranged in layers. There is a regular arrangement of fixed positive ions which can slide past each by applying pressure.

In alloys there is a mixture of metals with another metal or a non metals. Another metal being different in shape and size distort the regular arrangement of the metal lattice.

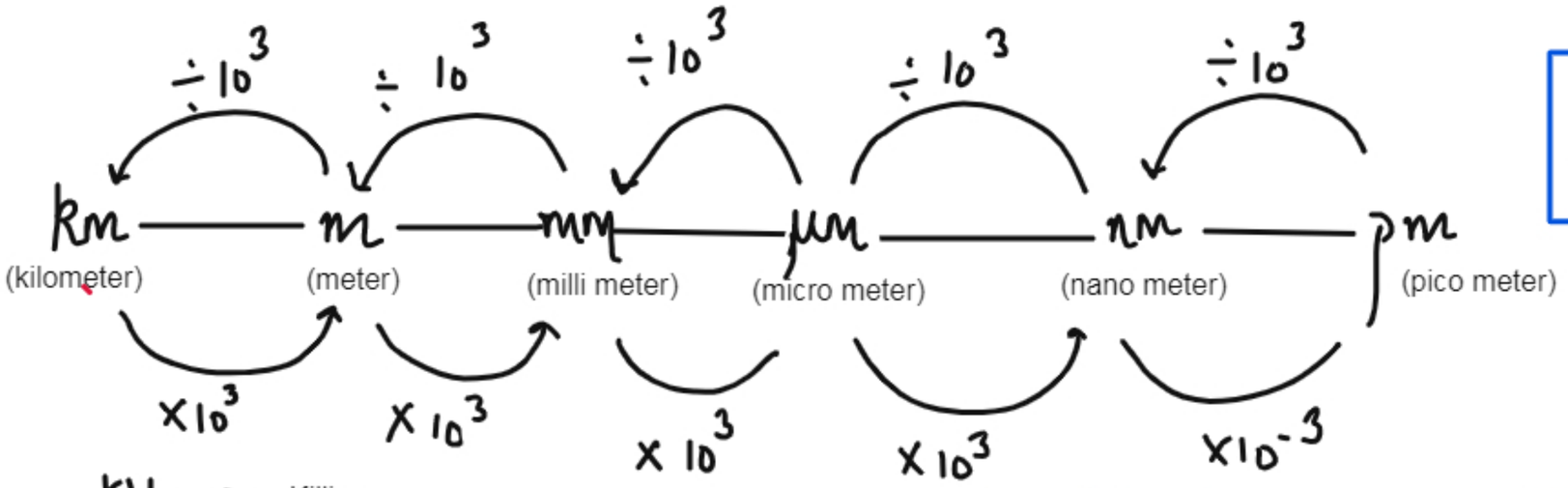
As a result the layers of the metal can no longer slide past each other making it strong

www.expertguidance.co.uk
mahima.laroyia@expertguidance.co.uk
+447448352272

÷ 10^9

NANOPARTICLES

Nanoparticles are the particles that deals with the paricles of size 1 to 100 nm.



1 nm = 1 × 10^-9 m

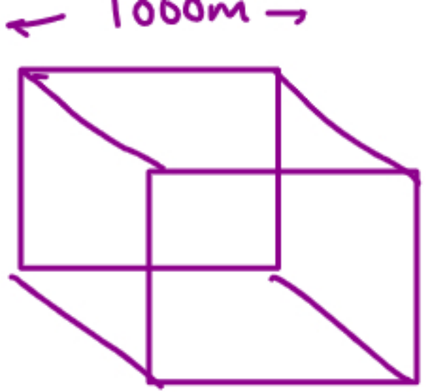
KIL — Killing
MET — Metal
MIL — Milo
MIC — Mickey
NAN — Nano
PIC — Pictures

Convert 10 nm to :-

a) meter → nm —÷10^9→ m = 10 m / 10^9 = 10^-8 m

b) micrometer → μm —÷10^6→ m = 10 m / 10^6 = 10^-5 m

www.expertguidance.co.uk
mahima.laroyia@expertguidance.co.uk
+447448352272



Surface Area = 6 x side X side m^2

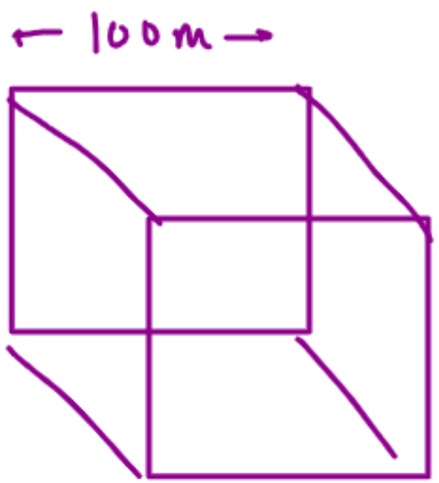
$= 6 \times 1000 \times 1000$

$= 6 \times 10^6 m^2$

Volume = side X side x side

$= 10^9 m^3$

SA : Volume $= \frac{6 \times 10^6}{10^9} = 6 \times 10^{-3} /m$



Surface Area = 6 x side X side

$= 6 \times 100 \times 100$

$= 6 \times 10^4 m^2$

Volume = side X side x side

$= 10^6 m^3$

SA : Volume $= 6 \times 10^2$

As the size decreases the surface area to volume ratio increases.

Therefore Nano particles being very small in size have large surface area to volume ratio making thew very useful in Science and Medicine.

www.expertguidance.co.uk
mahima.laroyia@expertguidance.co.uk
+447448352272

APPLICATIONS OF NANOPARTICLES

To kill cancer and tuomour cells

MEDICINES

For drug delievery

Used in Sunscreen to block sunlight

COSMETICS

They have large surface area to volume ratio.

CATALYST

Used in small quantities so highly effective

Self cleaning window panes

HOUSEHOLD

Nano particles breaks dirty in the presence of sunshine which is washed away by water while raining.

www.expertguidance.co.uk
mahima.laroyia@expertguidance.co.uk
+447448352272

RISKS OF NANOPARTICLES

- Due to small size can cause difficulty in breathing
- They can accumulate in the envrionment and cause air pollution
- Due to their large surface area a small spark can result in violent explosion making them risky to use.
- They are toxic and cause breathing and respiratory problems.
- Due to their small size they can also cause water pollution and risk the aquation life.

www.expertguidance.co.uk
mahima.laroyia@expertguidance.co.uk
+447448352272

NEXT STEP !!!!!

- Check the specification

- Do Exam Style Questions on this topic

www.expertguidance.co.uk
mahima.laroyia@expertguidance.co.uk
+447448352272