

- **Malleable** Substances that can be rolled into thin sheets
- **Ductile** Substances that can be draw into strands of wire
- **Melting Point:** The temperature at which a *solid* changes its phase or state to become a *liquid*.
- **Freezing Point** The temperature at which a *liquid* changes its phase to become a *solid*
- **Boiling Point** The temperature at which a *liquid* changes its phase to become a *gas*.

Radio Broadcast 10 Sept 18:00 -19:00

Questions for Discussion

For each of the following materials, say what properties of the material make it important in carrying out its particular function:

- tar** on roads
- iron** burglar bars
- plastic** furniture
- metal** jewellery
- clay** for building
- cotton** clothing

Radio Broadcast 11 Sept 18:00 -19:00

Questions for Discussion

You are given three substances labelled X, Y and Z. The melting and boiling points of these substances are tabulated below:

Substance	Melting Point ($^{\circ}\text{C}$)	Boiling Point ($^{\circ}\text{C}$)
X	-218,4	-183
Y	-24	76
Z	112	440

- What state of matter (i.e. solid, liquid or gas) will each of the substance be in at room temperature (25°C)?
- Which of these substances has the strongest forces between its particles? Give a reason for your answer.
- Which of these substances has the weakest forces between its particles? Give a reason for your answer.

ATOMIC THEORY

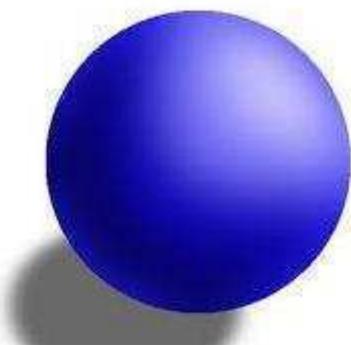
STUDY NOTES

- **Atom:** The smallest unit of any element is the atom. The atom of every element has a different number of protons
- **Proton:** Positively charged particles found in the nucleus of atoms. A proton has an atomic mass of 1μ
- **Neutron:** Neutral particles found in the nucleus of atoms. A neutron has an atomic mass of 1μ
- **Electron:** Negatively charged sub atomic particles that have a very small mass. Electrons are found in different energy levels relatively far away from the nucleus.
- **Atomic orbital:** The region around the nucleus where an electron of a specific energy may be found.
- **Atomic Number (Z):** The number of protons in the nucleus of an atom.
- **Mass Number (A):** The number of protons and neutrons in the nucleus of an atom
- **Isotopes:** Atoms of an element have the same number of protons (same Z), but a different number of neutrons.
- **Relative atomic mass:** The average mass of all the naturally occurring isotopes of that element measured in atomic mass units.

Models of the Atom

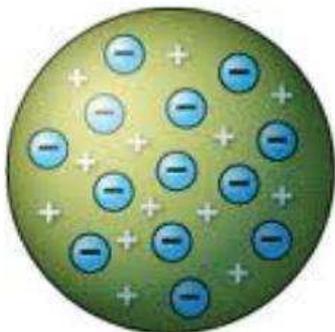
John Dalton

Based on careful analysis of chemical reactions, Dalton proposed a model in which all matter consists of tiny, solid indestructible spherical particles called atoms.

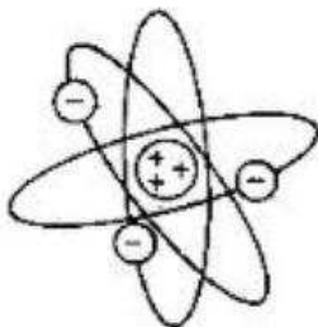


J J Thomson

Based on the growing understand of electrostatics, electricity and the discovery of tiny negatively charged particles, called electrons J J Thomson propose the Plum pudding model of the atom. He suggested that the atom is made of smaller particles that carry positive and negative charges. The charged particles on the surface of the atom can be removed when materials are rubbed together.

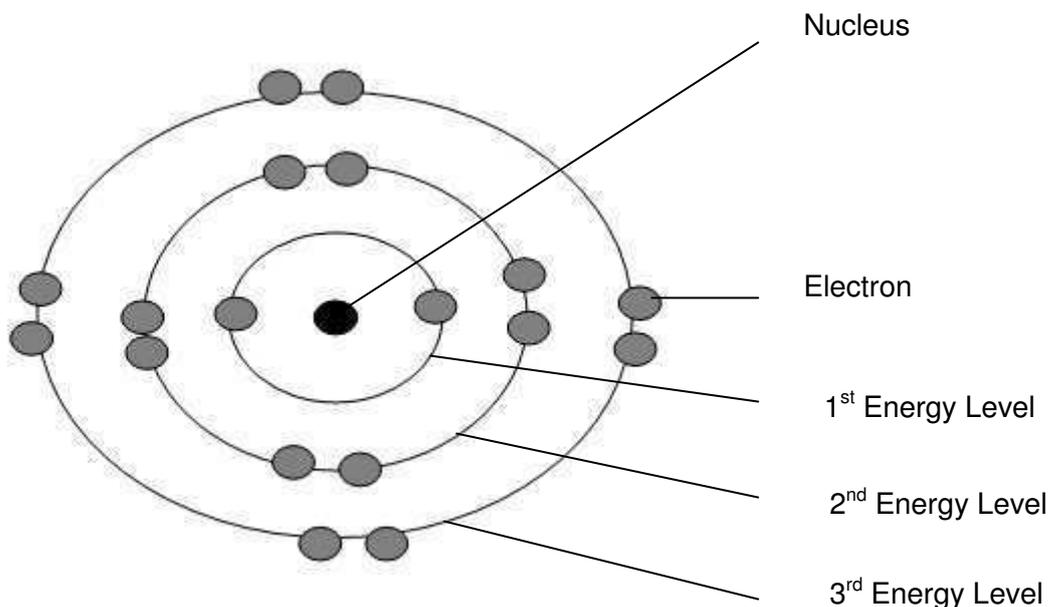
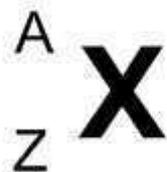
**E Rutherford**

Based on his gold foil experiment, he proposed a model of the atom which has a positive nucleus, containing protons and neutrons, at the centre of the atom and negatively charged electrons moving in orbits around the nucleus. In this model, the mass of the atom is mostly contained in the nucleus. The distance between the nucleus and electrons is relatively large and is empty space



N Bohr

Bohr proposed that electrons are arranged in energy levels at different distances away from the nucleus of the atom.

**Representing an atom**

A – mass number

Z – Atomic number

X – the symbol of the element formed by these atoms

The number of protons is unique to each element. Only hydrogen has atoms with one proton.