

Space (TRIPLE)

Threshold Concept

The Solar System is made up of many types of objects.

Keywords

Solar System - the collection of eight planets and their moons in orbit round the Sun, together with smaller bodies in the form of asteroids, meteoroids, and comets.

Orbit - the curved path of a celestial object or spacecraft round a star, planet, or moon

Sun - the star around which the 8 planets of the Solar System orbits.

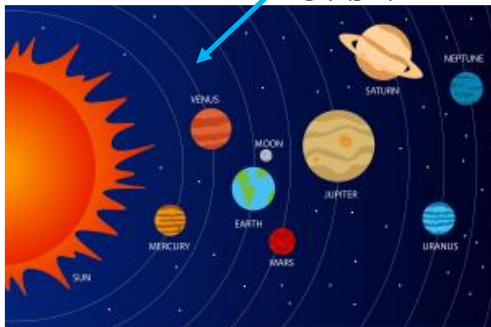
Planet - a celestial body moving in an elliptical orbit round a star.

Moon - a celestial body moving in orbit around a planet. They are natural satellites.

Satellite - an object, either natural (e.g. The Moon), or artificial, that orbits a moon, planet or star. Artificial satellites are for information gathering.

Solar System

Orbit



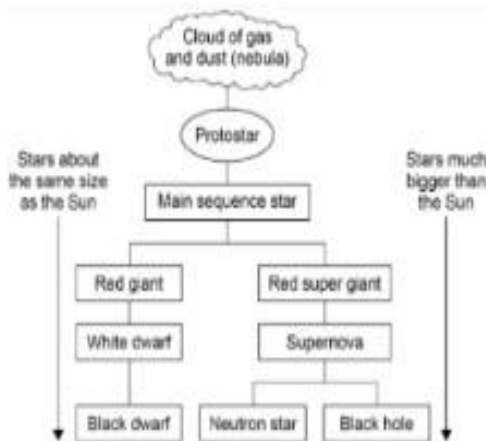
Link to information on the whole topic, consisting of slides, videos, and quizzes

Orbital Motion & Satellites

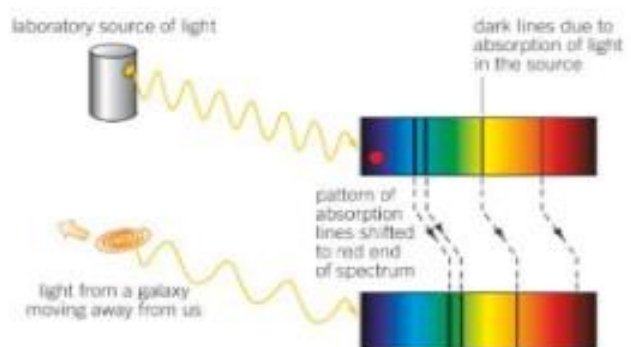
Planets orbit in near-circular orbits: they maintain a constant speed but are always changing direction. This means they have a constant speed but NOT a constant velocity

The Moon is a Natural Satellite. All other satellites of Earth are artificial, such as weather, military, ISS, GPS etc. Geostationary satellites follow the same point above Earth, so have an orbital period of 24 hours.

Life Cycle of Stars



Red-shift and Big Bang



Equations for this topic

Required Practical

Chemical analysis Triple

Threshold Concept

How do we identify a substance?

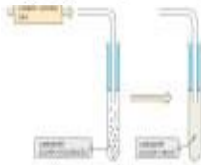
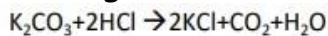
Testing for metal ions

Metal ions will form coloured precipitates when they react with sodium hydroxide.

Metal Cation	Effect of adding NaOH
Aluminium (Al^{3+})	White precipitate, dissolves in excess NaOH to form a colourless solution
Magnesium (Mg^{2+})	White precipitate, insoluble so remains in excess NaOH
Calcium (Ca^{2+})	White precipitate, insoluble so remains in excess NaOH
Copper (II) (Cu^{2+})	Light blue precipitate, insoluble in excess
Iron (II) (Fe^{2+})	Green precipitate, insoluble in excess
Iron (III) (Fe^{3+})	Red-brown precipitate, insoluble in excess



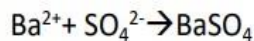
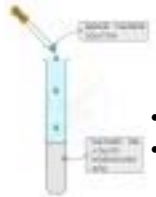
Testing for carbonate ions CO_3^{2-}



- Metal carbonate and hydrochloric acid
- Forms Carbon dioxide
- Turns lime water cloudy



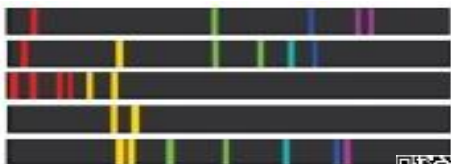
Testing for Sulphate ions (SO_4^{2-})



- Add barium chloride
- White precipitate formed



Flame emission spectroscopy



An instrumental technique used to identify metal ions.



Keywords

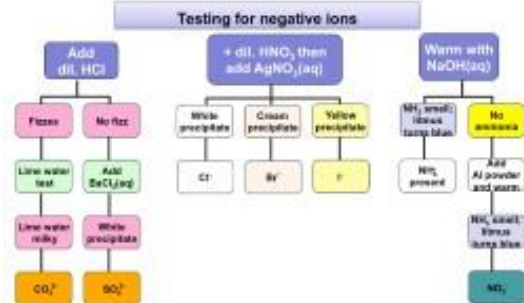
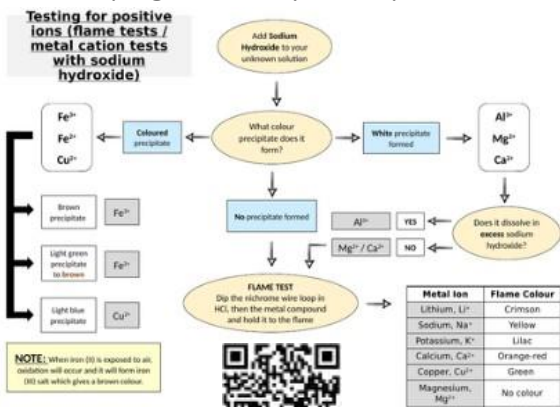
Pure - a substance made from just one element or compound

Impure - a substance made from more than one element or compound

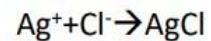
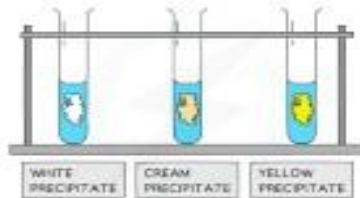
Analyse - to find the chemical composition of a substance

Sample - a portion of a substance taken from a larger amount

Identifying ions required practical



Testing for Halide ions (Cl^- , Br^- , I^-)



- Add nitric acid
- Add a few drops of silver nitrate
- Chloride forms a white precipitate
- Bromide forms a cream precipitate
- Iodide forms a yellow precipitate

