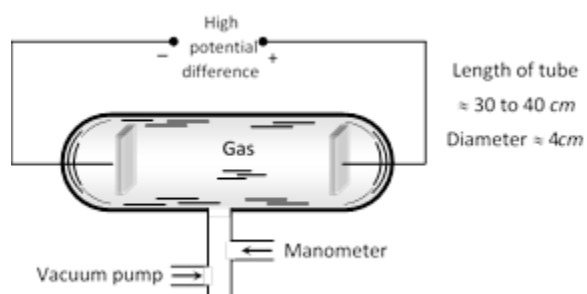


## Electric Discharge through gases:

At normal atmospheric pressure, the gases are poor conductor of electricity. If we establish a potential difference (of the order of 30 kV) between two electrodes placed in air at a distance of few cm from each other, electric conduction starts in the form of sparks.

The discharge of electricity through gases can be systematically studied with the help of discharge tube shown below



As the pressure inside the discharge tube is gradually reduced, the following is the sequence of phenomenon that are observed.

(1) At normal pressure no discharge takes place.

(2) At the pressure 10 mm of Hg, a zig-zag thin red spark runs from one electrode to other and cracking sound is heard.



(3) At the pressure 4 mm. of Hg, an illumination is observed at the electrodes and the rest of the tube appears dark. This type of discharge is called dark discharge.

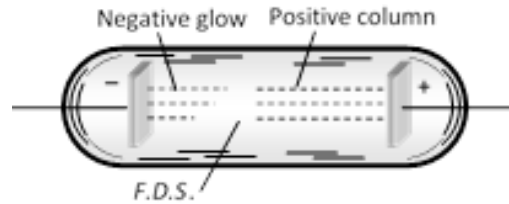
(4) When the pressure falls below 4 mm of Hg then the whole tube is filled with bright light called positive column and colour of light depends upon the nature of gas in the tube as shown in the following table.

Color for different gases

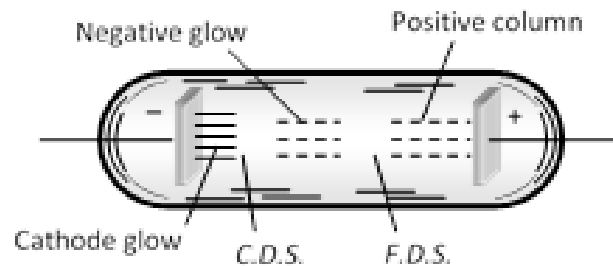
Gas	Air	H <sub>2</sub>	N <sub>2</sub>	Cl <sub>2</sub>	CO <sub>2</sub>	Neon
Colour	Purple red	Blue	Red	Green	Bluish white	Dark red

(5) At a pressure of 1.65 mm of Hg :

Sky colour light is produced at the cathode it is called as negative glow. Positive column shrinks towards the anode and the dark space between positive column and negative glow is called Faradays dark space (FDS).



(6) At a pressure of 0.8 mm Hg : At this pressure, negative glow is detached from the cathode and moves towards the anode. The dark space created between cathode and negative glow is called as Crook's dark space. Length of positive column further reduced. A glow appear at cathode called cathode glow.



(7) At a pressure of 0.05 mm of Hg : The positive column splits into dark and bright disc of light called striations.

(8) At the pressure of 0.01 or 10–2mm of Hg some invisible particles move from cathode which on striking with the glass tube on the opposite side of cathode causes the tube to glow. These invisible rays emerging from cathode are called cathode rays.

(9) Finally when pressure drops to nearly 10–4mm of Hg, there is no discharge in tube.