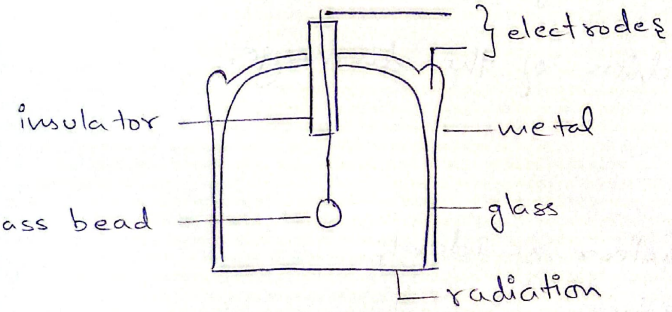
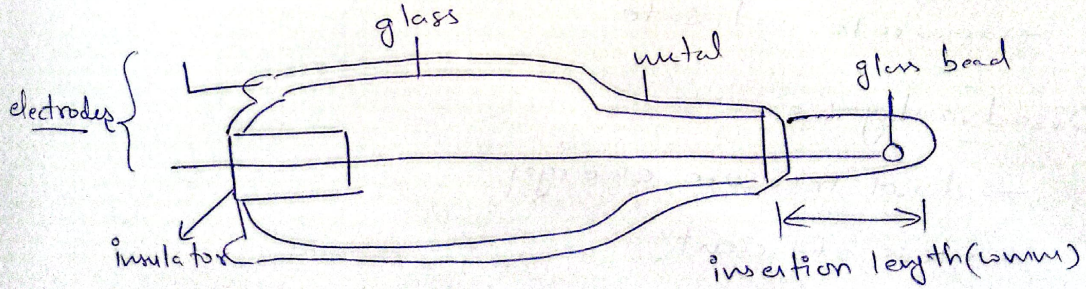
→ Geiger Muller Counter -

* most use gas filled couter.
* a geiger counter is an instrument used for detecting and measuring ionizing radiation.
* applications - ① Radiation Dosimetry
② Radiological Protection
③ Experimental Physics
④ Nuclear Industry

* it detects ionizing radiations such as α-particles, β-particles and γ-rays using the ionization effect produced in a Geiger Muller tube.
* one of world's best known radiation detection instrument.
* it can be made to have longer operating life by particularly using Halogen gas filling.
* commercially available varieties -
① End-window type
② Cylindrical type
③ Narrow type





needle type design

* the gregor muller tube is filled with a gas such as Neon, Argon (or) Helium at the pressure being lowest.

* unit → counts per minute (CPM)

* other parameters - ① pressure = 0.1 - 0.15 kg/cm²
② inert gas = 90%
③ ethyl alcohol = 10%

* in end window type, a metal coated glass tube of cylindrical form has a thin thungsten wire of 0.002 - 0.01 cm diameter passing through the centre acting as the collector electrode with the body as the other.

* the end window is usually made of mica sheet of a thickness less than 1 mg/cm³.

* to avoid spark, it terminates to a glass bead.

* in GM counter, the Townsend discharge occurs and with the bulk of electrons in the discharge being collected by the anode, a positive ion sheath (or) cloud is left to reduce the field and stop the discharge, which is called Quenching of the discharge.

Advantages -

→ prevent nuclear accidents.
→ highly sensitive.
→ accurate and safe.

Disadvantages :

→ donot measure energy.
→ less efficient.
→ lifetime reduction.