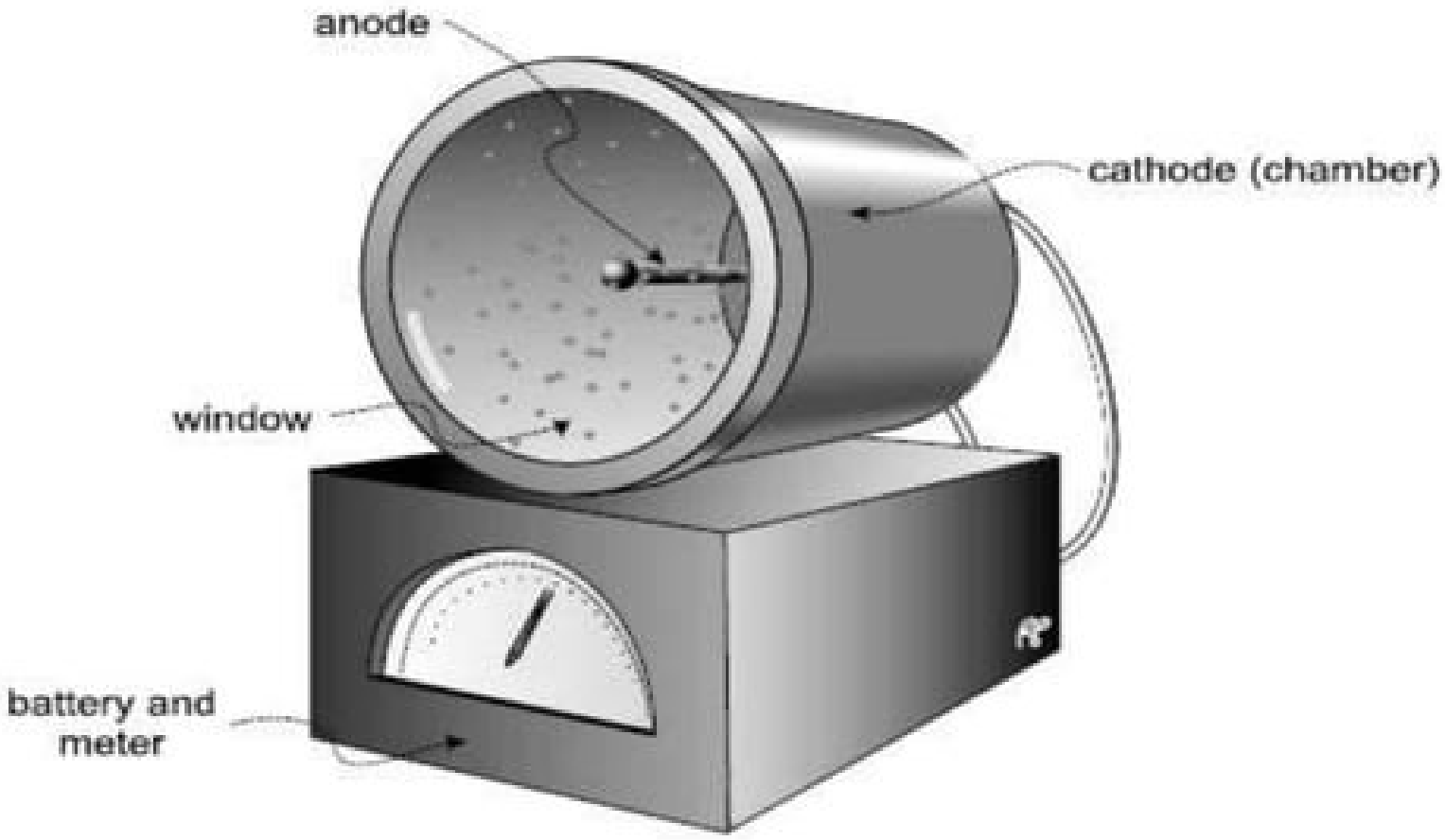
IONIZATION CHAMBER

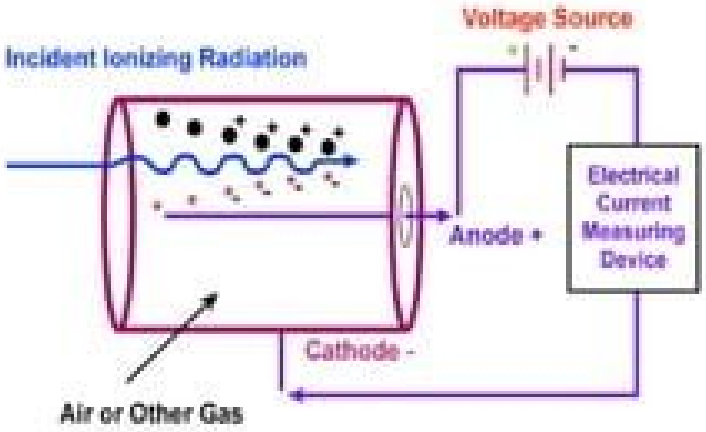


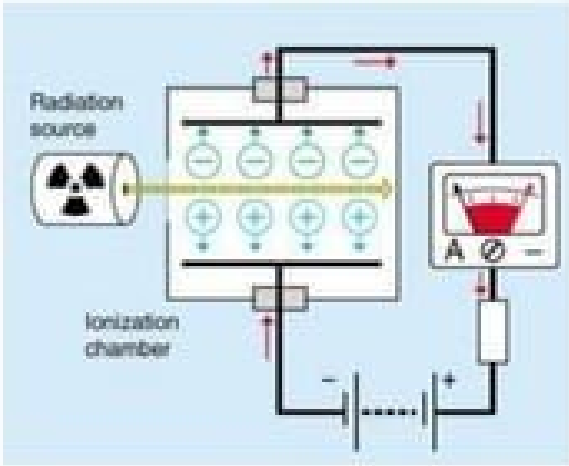
IONIZATION CHAMBER

- The **ionization chamber** is the simplest of all gas-filled radiation detectors, and is widely used for the detection and measurement of certain types of ionizing radiation; X-rays, gamma rays and beta particles. Conventionally, the term "ionization chamber" is used exclusively to describe those detectors which collect all the charges created by *direct ionization* within the gas through the application of an electric field.

PRINCIPLE

- Is an ionization detector which main function is to measure . the ion pairs created when ionization mediation through the gas . the ion pairs are attached either in the positive or negative electrodes which are then connected the battery therefore reading measurement of ionizing radiation (AKA ionization induced electric)





CHAMBER TYPES AND CONSTRUCTION :

- Free-air chamber
- Vented chamber
- Sealed low pressure chamber
- High pressure chamber
- Research and calibration chambers

IONIZATION CHAMBER REGION

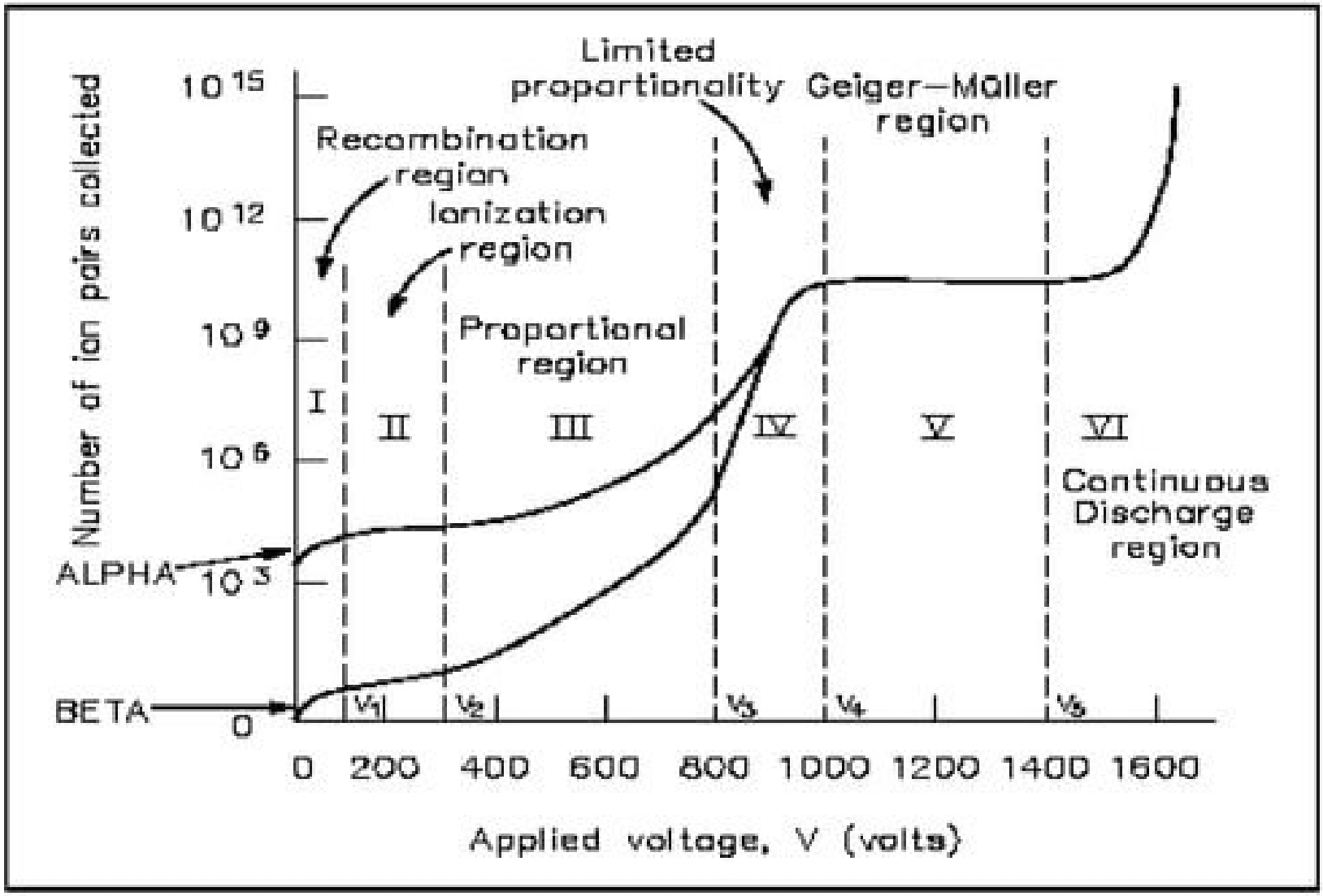


Figure 6 Ion Pairs Collected -vs- Applied Voltage

IONIZATION CHAMBER REGION

- As voltage is increased in the ionization there is no appreciable increase in .region the pulse height. The field strength is more than adequate to ensure collection of all ions produced; however, it is insufficient to cause any increase in ion pairs due to gas amplification. This region is called the ionization chamber region

ADVANTAGES

- Accurate and precise
- Recommended for beam calibration
- Instant readout
- using in N.M (hot lab)
- for important structure in dose collimator

DISADVANTAGES

- Connecting cables required
- High voltage supply required
- Many corrections required for high energy dosimetry