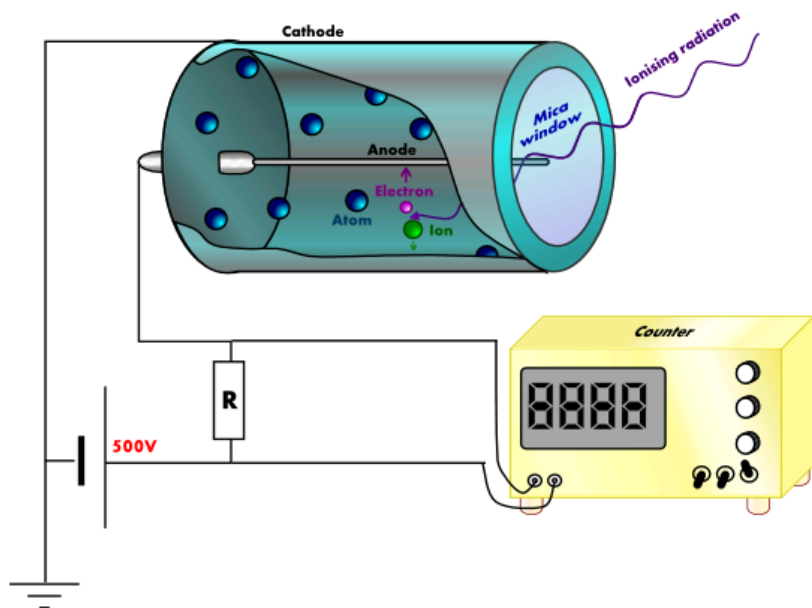


Describe the construction and working of Geiger counter.

Answer:



Main element of a Geiger counter is the Geiger-Muller tube, which is basically a chamber filled with inert gas or a mix of organic vapor and halogens.

The tube contains two electrodes, the anode (+) and the cathode (-). The anode is represented by a wire in the center of the cylindrical chamber while the cathode forms the lateral area. One end of the cylinder, through which the radiation enters the chamber, is sealed by a mica window.

As ionizing radiation coming from the surrounding medium passes through the mica window and enters

the Geiger-Muller tube, it ionizes the gas inside, transforming it into positively charged ions and electrons. The electrons eventually migrate towards the anode of the tube detector, while the positively charged ions accelerate towards the cathode. As the positive ions move towards the cathode, they collide with the remaining inert gas thus producing more ions through an avalanche effect. When this happens an electrical current is established between the two electrodes.

This current can then be easily collected, amplified and measured or counted and played in the form of an acoustic signal made out of clicks, each of which should correspond to the detection of a single ion. To improve the detection, multiple discharge stopping techniques can be used, either by removing the high voltage from the electrodes or by inserting additional organic or halogen gases in the inert mix.