

Chapter 18

Use with Section 2

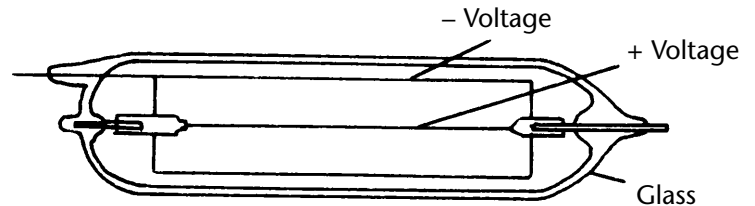
ENRICHMENT

● The Nucleus

The Geiger Counter

In 1908, German physicist Wilhelm Geiger developed the Geiger counter. The Geiger counter is used to detect when radiation is present. Geiger counters are used by anyone who works around radiation or believes he or she may come into contact with it. The Geiger counter allows scientists and other professionals to detect not only the presence of radiation but also the levels of radiation.

Like almost anything else, Geiger counters come in many different sizes and shapes, but the essential design is always the same. The Geiger counter has a tube filled with an inert gas. The tube also has a filament, or fine wire, that runs the length of it. Electricity is used to create an electric field between the filament and the walls of the tube. However, because the inert gas does not conduct electricity, an electric current is only produced when the inert gas is ionized and negative and positive ions are present.



The filament is negatively charged and the walls of the Geiger counter are positively charged. If radiation is present, it will enter the tube and cause the atoms of the inert gas to ionize. When the inert gas ionizes, the negatively charged ions are attracted to the walls of the chamber, while the positively charged ions are attracted to the filament.

When the inert gas is ionized, it conducts electricity, and an electrical current is created between the walls of the Geiger counter and the filament. The electrical pulse is what causes the Geiger counter to make the familiar static and clicking sounds. The louder and more frequent the clicking, the higher the level of radiation present.

Answer each question using complete sentences.

1. What is the most important property of the gas that is used to fill the Geiger counter's chamber?

2. Describe why you think the property you chose for your answer to question number one is important.
