

Holes in the ozone layer have led to increased intensity of ultra-violet radiation reaching the Earth's surface. Marine biologists are concerned about the effect which this is having on fish and plant life in the ocean.

Design a laboratory experiment to investigate how the absorption of ultra-violet radiation by water depends upon the depth of water which the ultra-violet radiation passes through. The only detector of ultra-violet radiation available is illustrated in Fig. 3.1.

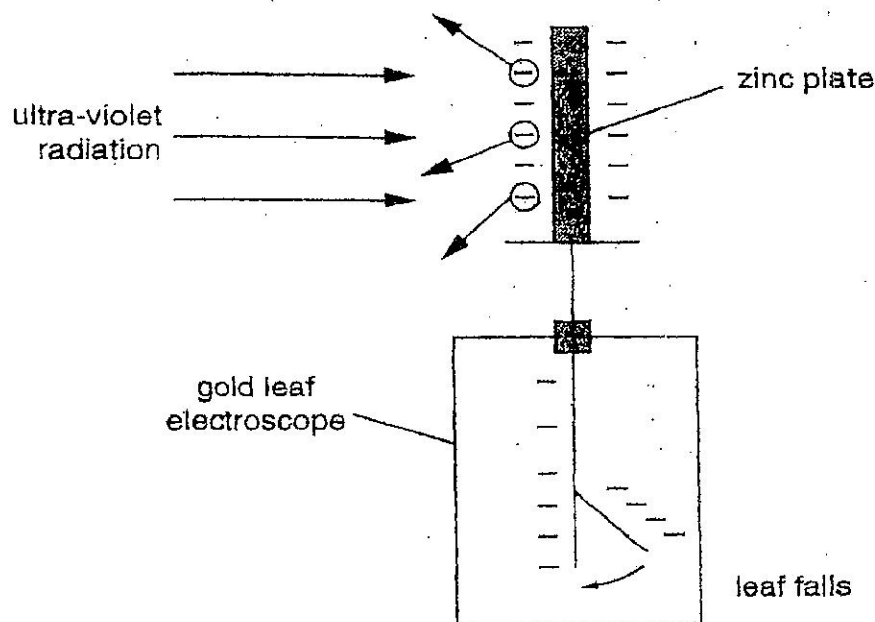


Fig. 3.1

This shows ultra-violet radiation incident on a zinc plate connected to a negatively charged gold-leaf electroscope. The ultra-violet radiation causes electrons to be ejected from the surface of the zinc plate. The gold leaf is observed to fall more rapidly when the intensity of the ultra-violet radiation is increased. It should be noted that glass does not transmit the ultra-violet radiation used in this experiment.

You may assume that the following equipment is available in addition to this detector.

Source of ultra-violet radiation
Metre rule
Stopwatch

Any other standard equipment (which may be found in a school or college science laboratory) may be used.

In your account, you should pay particular attention to

- the procedure to be followed,
- a method used to find a suitable container for the water used in the experiment,
- control of variables.