

Practical 1 – Option I

Absorption coefficient of gamma rays in lead

This experiment requires the use of a radioactive source and so special precautions need to be taken. If a radioactive source is not available then you can use the data in the student report that is attached and ask your students to analyse the data.

Criteria assessed

- DCP
- CE

Materials needed

- Four thin sheets of lead (about 3 mm each)
- Micrometer
- Electronic scale
- A gamma ray source (e.g. cobalt-60)
- A Geiger counter (the Geiger voltage should be adjusted to 400 V)
- A scaler/timer
- A digitimer

What to do

When a beam of gamma rays is incident on a sheet of lead of thickness x , the intensity of the gamma rays after going through the sheet is given by

$$I = I_0 e^{-\mu x}$$

where μ is called the absorption coefficient.

The idea of this experiment is to collect enough data so that determination of the absorption coefficient of lead will be made possible through appropriate graphs.