

Part C – Cloud Chamber

For this part of the experiment you will view a two (2) videos which were taken using the cloud chamber that is normally used in the lab experiment.

In the first video (which is around 2 ½ minutes long) you will look at a cloud chamber with no source. This will allow you to view the effects of naturally occurring radiation.

In the 2nd video there were two sources used. One source was Lead-210 which is **primarily a beta emitter** and the second source is a welding rod containing thorium and it is **primarily an alpha emitter**.

The behavior of the sources (and consequently what to look for) can be summarized as follows.

1) “The dense straight tracks are produced by α (alpha) particles and other massive charged particles, while β (beta) particles produce faint and often crooked tracks.”

2) "Thorium is primarily an alpha emitter. Daughters in the decay chain emit alpha, beta, and **gamma radiation**.

3) “In addition, γ (*gamma*) rays (*radiation*) interact with the gas molecules to produce energetic photo electrons, Compton electrons, and positive and negative electron pairs”.

1) & 3) are taken from **Diffusion Cloud Chamber** manual by AU Physics Enterprises and 2) is from Teledyne Tungsten Products (a manufacturer of thoriated welding rods) from in their MSDS Sheets.

The statements above imply that from one source you will see mostly faint (thinner) straight tracks while the other source will produce mostly alpha particles while producing a variety of other particles (and consequently a variety in the types of tracks).

The YouTube video for the no source cloud chamber can be found at <https://youtu.be/dZTslIK6fok>

The YouTube video for the cloud chamber with two sources can be found at:

Tuesday labs https://youtu.be/A9DMIfU_pBs

Wednesday labs-<https://youtu.be/m--WKjpCSww>

Thursday labs- https://youtu.be/A9DMIfU_pBs

To help with the identification of the types of particles observed see link on lab webpage (underneath the procedure). Link is named [What to look for in the cloud chamber](#)

Use your observations from the cloud chamber to answer questions. You are advised to look at the questions before you look at the video.