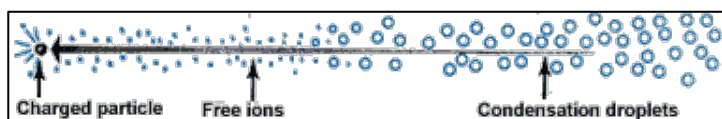


How can you see the “footprint” of radiation?

BACKGROUND:

A cloud chamber is a device that allows you to see evidence of invisible particles that are emitted from radioactive material. Jets flying high in the atmosphere leave behind trails, even if you can't see the jet itself, you can see the trail. The trail shows the path the jet took.

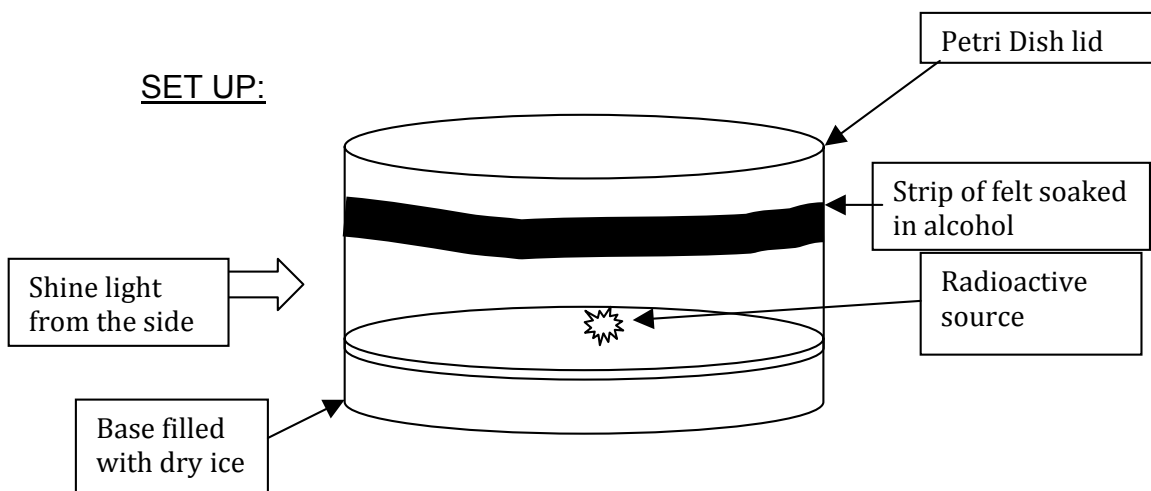


A cloud chamber shows the trail left by the particle emitted by the radioactive element. How does it do this? Inside the cloud chamber invisible droplets of alcohol condense around the invisible particle until the trail it leaves becomes visible. In order to see these “particle trails” you will need to use a light source and look very carefully.

MATERIALS:

- Cloud Chamber
- Lantern Mantle
- Isopropyl Alcohol
- Flashlights
- Dry ice
- Heat lamps

SET UP:



SAFETY:

1. Use gloves or tongs when handling the dry ice
2. Do not touch the heat lamps, they get very hot
3. Be careful with the alcohol, wash hands if any contact with skin
4. Wash hands before leaving lab area

PROCEDURE:

1. Drop alcohol on the black paper at the bottom of the cloud chamber.
2. Place cloud chamber under heat lamp and observe for vapor forming above the black paper (about 2 minutes).
3. Place cloud chamber on dry ice and wait about 5-10 minutes, this will have to be observed with the lights out and our flashlights on.
4. Look at cloud chamber from the side and top.

RESULTS:

1. Describe what you observed both from the top and the side of the cloud chamber.
2. Draw a cloud chamber below and label the source and a radiation particle track as it appeared to you.
3. Why is dry ice used?
4. Place a magnet near the side, draw what happened to the tracks.
5. What are the three types of particles that result from nuclear decay? Define them...
 - 1) _____
 - 2) _____
 - 3) _____
6. Exceeds: Based on what you know about these particles how do you think their tracks would be similar or different?