

What is a good radiation shielding?

Companion worksheet for Day 3 of Radioactive Nature – Radiation Shielding

Name: Student #: Date:

WARNING: Do **NOT** under any circumstances ingest any of these materials.

Methods

1. Turn on the Geiger-Müller (GM) counter
2. Record the background radiation
3. Place the sample on top of the probe that is covered by a nitrile glove
4. Orient the sample such that you find the maximum reading (change dial setting where appropriate)
5. Record the sample radiation (you may use the RESET button; see demo)
6. Insert the following materials between the sample and probe (see table)
7. Record the radiation reading for each material, and report your results

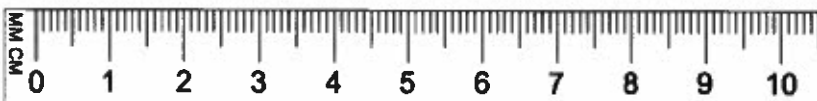
Results

Source	Shielding	Reading (cpm)	Setting (X)	Radioactivity (cpm)	Effectiveness Qualitatively
Background	-	1000	0.1	100	/
Sample	None	2200	1	2200	/
	Air, 8 cm	3000	0.1	300	+
	Aluminum foil Pliable	30 2200	1	2200	-
	Aluminum sheet Rigid	2200 1000	0.1	100	++
	Plastic Plexiglass, acrylic	1000	0.1	100	++
	Paper	2200	1	2200	-

* cpm = counts-per-minute

Discussion

1. What is/are good shielding material(s)? Explain using your measurements.
Plexiglass + Aluminum sheet Radiation → Background levels ✓
2. Using data with air shielding, how does distance (use the ruler provided) affect radioactivity?
Distance decreases with radioactivity detected ✓
3. Using data with aluminum shielding, how does material thickness vary with shielding effectiveness?
Thickness increases with shielding effectiveness ✓
4. Why is plastic (Plexiglass/ acrylic) more effective than paper?
→ These are more dense ✓



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