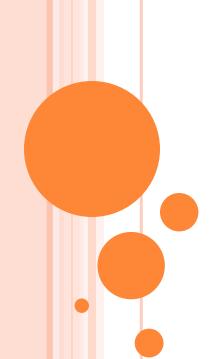
RADIOACTIVE HALF LIVES



•A radioactive element's half-life is an important factor in how dangerous the radiation can be to humans, plants, and animals

•A half life is the time required for half the original sample of matter to decay • For example, calcium-47 has a half life of 4 ½ days. *This* means that if we had a 10 gram sample of calcium-47, we would only have 5 grams left after 4 ½ days. The other 5 grams would have decayed into some other element.

oUranium-238 (the material used in atomic bombs) has a half life of 4.5 billion years. This is as long as scientists believe the earth has existed!

• Uranium-238 is much more harmful to humans than calcium-47. <u>A longer half-life means much more of the material</u> remains radioactive for so much longer.

• Iodine-131 is used in CAT scans of your thyroid and abdomen. It is safe to use in these tests because its half-life is only 8 days.

- If you are injected with 5 mL of Iodine-131, how much is left in 8 days?
- <u>○ 2.5 mL</u>
- o In 16 days?
- 1.25 mL
- o In 24 days?
- \circ 0.625 mL

oHow much of a 100.0 g sample of gold-198 is left after 8.10 days if its half life is 2.70 days?

012.5 g

oA 50.0 g sample of nitrogen-16 decays to 12.5 g in 14.4 seconds. What is its half life?

o7.2 seconds

oThe half life of potassium-42 is 12.4 hours. How much of a 750. g sample is left after 62.0 hours?

023.4 g

• There are 5.0 g of iodine-131 left after 40.35 days. How many grams were in the original sample if its half life is 8.07 days?

0160 g