

## Nuclear Q's

1. Find the diameter (in m) of an atom of
  - a. Al, molecular mass = 27 g/mol, density = 2.7 g/ml
  - b. Al, molecular mass = 70 g/mol, density = 5.9 g/ml
2. Find the binding energy and BE/nucleon of lithium-6, lithium-7, lithium-8, and lithium-9. How does the BE/nucleon relate to the stability of the atom?
3. How long would it take for 99% of a sample of sodium-24 to decay?
4. The activity of an unknown radioactive sample was 102 cts/sec. Forty-five hours later, it was 91 cts/sec. Find the half-life.
5. Uranium-235 has a half-life of  $7.1 \times 10^8$  years. If a rock containing some U-235 is 4.8 billion years old, what percent of the original U-235 remains?
6. Write the decay equation for
  - a. Magnesium-21
  - b. Iodine-129 which decays to Sb-125
7. How many counts per second come from 0.00001 g of Strontium-90? The half-life is 28.2 years.
8. A rock of U-235 has an activity of 200 cts/sec. How many grams of U-235 are present?