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NPRE 247

Homework 1

1. The hertz tells how many times per second something happens while the curie measures decays of a radioactive material per second. The reason it is in /s for curies is because decays don't have a proper unit.

2.

- a. B-11 has 5 protons, 6 neutrons.
- b. Na-24 has 11 protons, 13 neutrons.
- c. Co-60 has 27 protons, 33 neutrons.
- d. Pb-207 has 82 protons and 125 neutrons.
- e. U-238 has 92 protons and 146 neutrons.

3.

- a. Ga-71 is in the same isobar (same A different Z)
- b. As-72 in the same isotone (same n+ different A)
- c. Ge-71 is an isomer (same element but different energy state)

4.

$1.37 \times 10^{20}$  atoms of U-234

5.

a. 55.5 moles H<sub>2</sub>O

b. H-1 atoms -  $6.68 \times 10^{25}$

H-2 atoms -  $9.69 \times 10^{20}$

6.

a. 808 g of U-235

b.  $5.49 \times 10^{26}$  atoms/cc atom density of U-235

$2.20 \times 10^{27}$  atoms/cc atom density of U-238

7.

3.1608578889940397% U-235 by weight

8.

The diameter of a Uranium nucleus is  $6.8 \times 10^{-15}$  m larger than an Iron nucleus and also 1.85 times larger.

9.

Earth's new mass would be  $2.47 \times 10^{38}$  kg