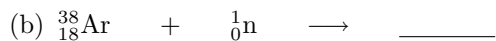


Chemistry 100
Homework Problem Set # 7
Due Wednesday, October 29

1. *Waldron*, Chapter 6, problem 22. Write the complete symbol (subscript and superscript) for the isotope that has:
 - (a) no charge, 56 electrons and 82 neutrons
 - (b) a charge of 2-, 37 electrons and a mass number of 76
2. *Waldron*, Chapter 6, problem 17. Identify what the question mark stands for in each reaction:
 - (a) ${}_{96}^{246}\text{Cm} + {}_6^{12}\text{C} \longrightarrow 4{}_0^1\text{n} + \underline{\hspace{1cm}}?$
 - (b) ${}_{34}^{82}\text{Se} \longrightarrow 2{}_{-1}^0\beta + \underline{\hspace{1cm}}?$
3. *Waldron*, Chapter 6, problem 15. What is the percentage of electricity produced by nuclear reactors in (a) South Korea (b) Lithuania (c) United States (d) Ukraine? (see section 6.5)
4. The following nuclei undergo alpha decay. Write the nuclear equation for each.
 - (a) U-234
 - (b) Ra-226
 - (c) Po-210
 - (d) Bi-210
5. The following nuclei undergo beta decay. Write the nuclear equation for each.
 - (a) Pb-214
 - (b) Tl-210
 - (c) Tl-206
 - (d) Pa-234

6. Complete the following nuclear reactions:



7. Write nuclear equations for the following nuclear reactions:

(a) A neutron induces the fission of U-235 to form two neutrons, one nucleus with 56 protons, and a second nucleus with a mass number of 94.

(b) U-235 and a neutron react to form Br-87, La-146 and more neutrons.

(c) U-238 is bombarded with a nucleus to produce Fm-249 and 5 neutrons.

8. *Waldron*, Chapter 6, problem 34. After 936 years, the amount of isotope X remaining is 25 percent of the original mass. What is the half-life of this isotope?

9. Strontium-85, used for bone scans, has a half-life of 64 days. How long will it take for the radiation level to drop to one eighth its original level?

