PS Chemistry Chapter 18 Review Questions Test Date_____

True/False. Correct the false statements.

___1. Helium-3 is the most abundant helium isotope.

___2. Isotopes have the same number of protons.

___3. Fission is the combining of two low-mass nuclei into one nucleus with a larger mass.

___4. Elements with an atomic number over 84 are radioactive.

___5. The daughter nucleus produced when Mo-103 undergoes beta decay is Zirconium-99.

___6. Hydrogen (H_2) is a diatomic molecule.

___7. Deuterium is an isotope of hydrogen.

___8. An alpha particle is equivalent to a helium-4 nucleus.

___9. This is the original "unstable" atom is called the daughter nucleus.

Fill-in-the-blank.

10. The first person to use the word radioactivity was _____.

11. A helium nucleus with two protons and two neutrons is called a(n)_____.

12. When two smaller nuclei come together, it is called _____.

13. In the Sun, hydrogen atoms fuse together to form _____.

Short answer or practice problems.

14. If a radioactive material has a half-life of years, what fraction of the material will remain after 30 years?

15. What are the three types of nuclear radiation? Place them in increasing order of penetrating power.

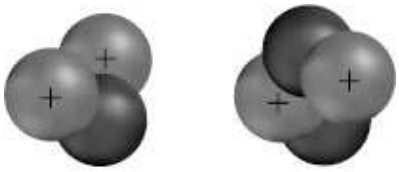
16. Thorium-234 has a half-life of 24 days. If you started with a 100-g sample of thorium-234, how much would remain after 72 days?

17. How much of a 10.0 g sample of polonium-214 remains after 600 microseconds? *The half-life of polonium-214 is 163.7 microseconds.*

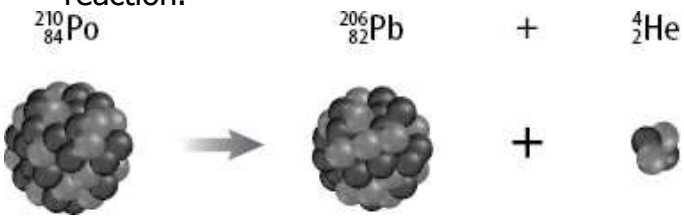
18. Write the correct notation for the isotope carbon-14.

19. What does fusion mean?

20. What is the same about the two nuclei? What is different?



21. Circle the alpha particle in the following reaction.



22. Complete the alpha decay equation.

$^{168}_{77}Ir \rightarrow$

23. Complete the beta decay equation.

$^{46}_{20}Ca \rightarrow$

24. What are found in the nucleus of an atom?

25. Boron has two naturally occurring isotopes with masses of 10.01 amu which occupies 19.91 percent and another isotope of 11.01 amu and occupying 80.09 percent. Calculate theaverage atomic mass of Boron.

Isotope	**Isotope Mass**	**Percent Abundance**
Boron-10	10.01	19.91
Boron-11	11.01	80.09

27. In a sample of 400 lithium atoms, it is found that 30 atoms are lithium-6 (6.015 amu) and 370 atoms are lithium-7 (7.016 amu). Calculate the average atomic mass of lithium.

28. Refer to the following symbol to answer the questions.

a. What isotope is represented?

b. How many protons does it contain?

c. How many neutrons does is contain?

d. What is its mass number?

e. Is it the most abundant isotope of the atom?

29. What elements are associated with the following symbol?

30. What does the stability of an isotope nucleus depend on?