Chapter 3 Test Review Name:_____Period: ___ Date:_____

Your test is on _____

Your test covers: atoms, isotopes, ions, average atomic mass, and moles.

1. Identify the element with 2 protons. Helium (atomic# 2 from PT)
2. 1 mole of helium has more/less equal to the number of atoms of 1 mole of nitrogen?
3. JJ Thomsen discovered the electron.
4. Rutherford discovered the nucleus and the proton.
5. Chadwick discovered the neutrons.
6. What is Avogadro's number? 6.022×10^{23}
7. The number of atoms in one mole of lead is 6.022×10^{23}.
8. Why is an uncharged atom electrically neutral? # p^+ = # e^- in neutral atoms
9. Calculate the number of protons, neutrons and electrons in a neutral atom of zinc-67. Zinc-67 = 30 p^+, 30 e^- & 37 n^0
10. An atom of sodium has 11 protons and 12 neutrons. What is its mass number? = 23amu
11. The atomic mass on the periodic table is the average atomic mass for all the known isotopes of that element.
12. A certain atom has 7 protons and 7 neutrons in the nucleus. This atom is an isotope of the element Nitrogen.
13. A certain atom has 35 protons and 48 neutrons in the nucleus. Write the isotope name and isotope notation for this isotope. Bromine-83 $^{83}_{35}Br$
14. Who conducted the gold foil experiment? Rutherford
15. His gold foil experiment led to the discovery of nucleus (a + dense mass in center of atom)
16. The mass of an atom is concentrated in the nucleus, but the majority of the volume of an atom is located in the electron cloud.
17. A positively charged subatomic particle is called a Proton.
18. A subatomic particle with no charge is called a neutron.
19. A negatively charged subatomic particle is called a/an electron.
20. What are the relative masses of all three subatomic particles? p^+ = 1 amu n^0 = 1 amu electron = so small it = 0 amu.
21. All isotopes of carbon contain 6 protons.
22. How many moles of hydrogen are in 6.2 grams of hydrogen?

$$\frac{6.2\text{ g H}}{1.0079\text{ g H}} \times \frac{1\text{ mol H}}{} = 6.151\text{ mol H}$$

23. Define isotope:

An atom of the same element that has a different mass.

24. How many protons, neutrons, and electrons are in a Ca^{2+} ion?

20 p^+, 18 e^-, 20 n^0

25. How many protons, neutrons, and electrons are in a P^{-4} ion?

15 p^+, 16 n^0, 19 e^-

26. How many atoms are present in 8.5 mol fluorine atoms?

$$8.5 \text{ mol F} \left| \frac{6.022 \times 10^{23} \text{ atoms F}}{1 \text{ mol F}} \right. = 5.1 \times 10^{24}$$

27. Calculate the number of moles in 22 grams of hydrogen.

$$22 \text{ g H} \left| \frac{1 \text{ mol H}}{1.0079 \text{ g H}} \right. = 21.83 \text{ mol H}$$

28. Calculate the number of atoms in 68.2 grams of potassium.

$$68.2 \text{ g K} \left| \frac{1 \text{ mol K}}{39.10 \text{ g K}} \right| \frac{6.022 \times 10^{22} \text{ atoms K}}{1 \text{ mol K}} = 1.05 \times 10^{26} \text{ atoms K}$$

29. Element X has two naturally occurring isotopes. X-80 is 25% abundant. X-82 is 75% abundant. Calculate the average atomic mass of element X.

$0.25 \times 80 = 20$
$0.75 \times 82 = 61.5$
} 81.5 amu