Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_ Period:\_\_\_\_\_\_\_\_

**UNIT 3: Test Review**

**Objective 1: SWBAT read the periodic table.**

1. Which has more neutrons: Rubidium or Zinc?

2. Put the following elements in order from **largest** to **smallest** atomic mass: Indium, Magnesium, Potassium, Krypton, Copper.

3. Miss Miller has identified an atom with an atomic mass of 48, 22 protons, 26 neutrons, and 22 electrons. She thinks it is iron, because iron’s atomic matches the number of neutrons she has found. Is she correct?

4. What subatomic particle determines an element’s identity?

**Objective 2: Students will be able to describe structure of the atom.**

5. Label the diagram below with the particles name and charges.

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Charge:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Charge:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Charge:\_\_\_Neutral\_\_\_\_\_\_\_\_

6. If an atom is neutral, what does that tell us about the number of protons and electrons the atom has?

7. Which subatomic particles contribute to an atom’s mass? Where are those particles found?

**Objective 3: Students will be able to describe isotopes of an atom and calculate average**

8. Define isotopes.

9. List the protons, neutrons, and electrons of each of the three isotopes of oxygen: 16O, 17O, and 18O.

10. Calculate the average atomic mass of an unknown element X that has three staple isotopes of equal abundance: 50X, 60X, and 80X.

11. Uranium has three common isotopes. If the abundance of 234U is 0.01%, the abundance of 235U is 0.71%, and the abundance of 238U is 99.28%, what is the average atomic mass of uranium?

12. The element copper has naturally occurring isotopes with mass numbers of 63 and 65.

The relative abundance and atomic masses are 69.2% for a mass of 62.93amu and 30.8% for a mass of 64.93amu. Calculate the average atomic mass of copper.

13. All isotopes will have the same number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but a different number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

14. Complete the table below using your periodic table and knowledge of isotopes:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Isotope** **Notation** | **Symbol****Notation** | **Atomic #** | **Protons** | **Electrons** | **Neutrons** | **Mass Number** |
| Potassium-39 |  |  |  |  |  |  |
|  | 3316S |  |  |  |  |  |
| Lead-201 |  |  |  |  |  |  |
|  | 20582Pb |  |  |  |  |  |
|  |  | 53 |  |  |  | 127 |
|  |  |  | 38 |  |  | 88 |
|  |  |  | 26 |  | 54 |  |

**Objective 4: Differentiate between element, compound and mixture**

15. Define an element. List **three** examples.

16. Define a compound. List **three** examples.

17. What is the difference between a homogenous mixture and a heterogeneous mixture? List three examples of each type of mixture.

18. Label each of the pictures below as an element (E), a compound (C) or a mixture (M).



\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

**Objective 5: Define energy levels in an atom and create Bohr models for common elements.**

19. How many electrons can fit into the First, Second, Third and Fourth orbits of the Bohr Model?

20. Draw the correct Bohr Models for the following atoms:

   

 Neon Argon Oxygen Lithium

21. Why is the Bohr model with orbitals incorrect?

**Objective 6: Students will be able to define valence electrons.**

22. What is a valence electron?

23. Fill in the table below with the correct number of valance electrons for each element:

|  |  |  |  |
| --- | --- | --- | --- |
| **Element** | **Valence Electrons** | **Element** | **Valence Electrons** |
| C |  | Bromine |  |
| Se |  | Strontium |  |
| Rb |  | Tin |  |
| Ne |  | Polonium |  |

24. Oxygen forms three stable isotopes: 16O, 17O, and 18O. Do all three isotopes have the same number of valance electrons? Explain.

25. If an atom has 57 electrons, how many are valance electrons? How do you know?

**Objective 6: Ions**

26. Ions from when an atom gains or loses \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

27. Fill in the table below with the appropriate charges of each ion:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Element** | **# Protons** | **Change** | **Charge** | **# Electrons** |
| *EX: Potassium* | *19* | *Loses 1 electron* | *+1* | *18* |
| Chlorine |  |  | +1 |  |
| Boron |  | Loses 3 electrons |  |  |
| Sulfur |  |  | -2 |  |
| Calcium |  |  |  |  |
| Lead |  |  |  |  |
| Iron |  |  |  |  |
| Oxygen |  |  |  |  |

28. Why do ions form?

29. You have a neutral atom of chlorine. Explain what would happen in the following scenarios:

 a. You add 3 protons to the atom

 b. You had 3 electrons to the atom

 c. You add 3 neutrons to the atom

**Objective 7: Students will be able to convert among atoms, molar mass, and moles.**

**COMPLETE THE PROBLEMS BELOW IN YOUR NOTEBOOK TO RECEIVE CREDIT (on the NB page this is attached to!). NO PROBLEMS DONE ON THIS SHEET WILL BE COUNTED!!!!**

30. How many moles are in 3.5 grams of Tellerium?

31. How many atoms are in 4.7 moles of water?

32. How many atoms are in 17.2 grams of ethanol, C2H6O?

33. How many moles are in 6.5 x 1032 atoms of calcium oxide, CaO?

34. How many grams are in 7.7 x 1077 atoms of NaCl?

35. How many grams are in 0.57 moles of sulfuric acid, H2SO4?