**Topics – Test 3 Review**

1) List each of Dalton’s five laws and indicate whether or not they are true:

* **Atoms are small, indestructible spheres: False (they are not indestructible)**
* **Atoms of the same element have the same properties: False (isotopes have different properties)**
* **Atoms of different elements have different properties: True**
* **Atoms obey the law of conservation of mass: True**
* **Atoms obey the law of multiple proportions (this can also be stated as “compound formulas always come as whole-number ratios): Tru**

2) Fill out the blanks in this table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Element** | **Protons** | **Neutrons** | **Electrons** | **Atomic mass** | **Atomic number** |
| F | 9 | 11 | 9 | 20 | 9 |
| Ts | 117 | 177 | 117 | 294 | 117 |
| Bi | 83 | 127 | 83 | 210 | 83 |
| Os | 76 | 105 | 76 | 181 | 76 |
| Au | 79 | 120 | 79 | 199 | 79 |
| Sr | 38 | 50 | 38 | 88 | 38 |

3) Define the term “average atomic mass”.

**A weighted average of the atomic masses of each isotope of an element.**

4) Element X has two isotopes: X-110 has a mass of 110 amu and an abundance of 68% X-112 has a mass of 112 amu and an abundance of 32%. Given this information, what is the average atomic mass of element X?

**Average atomic mass = (110 amu)(0.68) + (112 amu)(0.32)**

**= 74.8 amu + 35.8 amu = 110.6 amu**

5) What is the difference between a line spectrum and a continuous spectrum?

**A line spectrum shows only particular colors/energies of light, while a continuous spectrum shows all colors of light (which represents a continuous range of energies). If you say “lines of color vs. rainbow”, this means the same thing.**

6) Explain the process by which light is given off by an element when energy is added to it.

**Energy is added to an atom, which causes an electron to jump from a low energy state to a higher energy state (ground state to excited state). When the electron falls back down to the ground state, it gives off this energy as light.**

7) List three general properties of metals.

**Malleable, ductile, shiny, conduct electricity, hard, high melting point, high boiling point.**