***Atomic Structure***

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

**Chem Pd:\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_**

***Isotope Lab***

*Average atomic mass*—the weighted average of the masses & relative abundance of all the isotopes of an element.

***Depends on two things:***

Avg Mass= (mass)(%) + (mass)(%)…

100

* *The mass of the isotopes*
* *The relative abundance of the isotopes*

1. Count out each color of isotope: ( only the whole pieces)

|  |  |
| --- | --- |
| Color | Number of pieces |
| RED |  |
| %GREEN |  |
| ORANGE |  |
| YELLOW |  |
| PURPLE |  |
| BLUE |  |

2. Find the % abundance for each isotope by dividing the number of each color by the total number of all isotopes and multiplying by 100.

Show the work for ONE PROBLEM here…

|  |  |
| --- | --- |
| Color | % OF ABUNDANCE |
| RED |  |
| GREEN |  |
| ORANGE |  |
| YELLOW |  |
| PURPLE |  |
| BLUE |  |

1. Your assistance found the weight of each of your isotopes. The masses of each isotope have been ***predetermined*** as follows:

|  |  |
| --- | --- |
| Color | Total mass |
| RED | 49.6785 grams |
| GREEN | 48.5646 grams |
| ORANGE | 50.0786 grams |
| YELLOW | 47.0057 grams |
| PURPLE | 50.5697 grams |
| BLUE | 46.4324 grams |

1. Calculate the [(MASS)(%)]/100 for each isotope. ***Add*** the numbers all together at the end for the average atomic mass.

Show the work for ONE PROBLEM here…

|  |  |
| --- | --- |
| Color | (Mass) (%) |
| RED |  |
| GREEN |  |
| ORANGE |  |
| YELLOW |  |
| PURPLE |  |
| BLUE |  |
| Total (all added together) |  |

**Your calculated Average Atomic Mass**

***Analysis & Conclusions***

1. Relate finding the average atomic mass of fruit loops to the average atomic mass of any element on the periodic table.
2. What are the limitations to using fruit loops vs. “real” isotopes of an element?
3. Calculate the atomic mass of the elements listed below. Assume the isotopic composition(s) given below.
   1. Hydrogen-1 (99.985%); Hydrogen-2 (0.015%)
   2. Chlorine-35 (75.53%); Chlorine-37 (24.47%)
   3. Argon-35 (0.337%); Argon-38 (0.063%); Argon-40 (99.60%)
   4. Tellurium-122 (0.089%); Tellurium-124 (2.46%); Tellurium-126 (5.48%); Tellurium-128 (91.97%)
4. For all of the isotopes below indicate the #p+, #n0, & # e-.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Isotope*** | ***# protons*** | ***# neutrons*** | ***# electrons*** |
| Hydrogen-1 |  |  |  |
| Hydrogen-2 |  |  |  |
| Chlorine-35 |  |  |  |
| Chlorine-37 |  |  |  |
| Argon-35 |  |  |  |
| Argon-38 |  |  |  |
| Argon-40 |  |  |  |
| Tellurium-122 |  |  |  |
| Tellurium-124 |  |  |  |
| Tellurium-126 |  |  |  |
| Tellurium-128 |  |  |  |

1. Analyzing the table above, ***what is the difference*** between isotopes of the SAME element? ***Use an example from the table above to defend your answer.*** ☺