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Chemistry ~Ms. Hart Class: Anions or Cations

## 3.7- Homework - Average Atomic Mass

Directions: Complete all open responses questions in a complete sentence!

1) How do the isotopes of a given element differ from one another?
2) How can there be more than 1000 different atoms if there are only about 100 different elements?
3) Which pair must represent atoms of the same element?
1. ${ }_{6}^{14} X$ and ${ }^{14} X$
2. ${ }_{6}^{12} \mathrm{X}$ and ${ }^{13} \mathrm{X}$
3. ${ }^{2} X$ and ${ }^{4} X$
4. ${ }^{13} X$ and ${ }^{14} X$
4) All samples of an element are composed of atoms with the same
1. atomic mass
2. atomic number
3. number of nucleons
4. number of neutrons
5) What does the number represent in platinum - 194? Write the symbol for this atom using isotopic notation (superscripts and subscripts).
6) What is the difference between mass number and average atomic mass?
7) Which symbols represent atoms that are isotopes of each other?
1. ${ }^{14} \mathrm{C}$ and ${ }^{14} \mathrm{~N}$
2. ${ }^{16} \mathrm{O}$ and ${ }^{18} \mathrm{O}$
3. ${ }^{131} \mathrm{I}$ and ${ }^{131} \mathrm{I}$
4. ${ }^{222} \mathrm{Rn}$ and ${ }^{222} \mathrm{Ra}$
8) Convert these percents to decimals
a. $65.78 \%=$ $\qquad$
b. $45.02 \%=$ $\qquad$
c. $4.31 \%=$ $\qquad$
d. $0.98 \%=$ $\qquad$
9) For each case, circle the mass number the average atomic mass should be closer to based on the percentages provided.

| Isotope | Percent Abundance |
| :---: | :---: |
| B-10 | $20 \%$ |
| B-11 | $80 \%$ |
|  |  |
| Isotope | Percent Abundance |
| Li-6 | $7 \%$ |
| Li-7 | $93 \%$ |

10) Element $X$ has two isotopes. If $72.0 \%$ of the element has an isotopic mass of 84.9 atomic mass units, and $28.0 \%$ of the element has an isotopic mass of 87.0 atomic mass units, the average atomic mass of element $X$ is numerically equal to
1. $(72.0+84.9) \times(28.0+87.0)$
2. $(72.0-84.9) \times(28.0+87.0)$
3. $(.72 \times 84.9)+(.28 \times 87.0)$
4. $(72.0 \times 84.9)+(28.0 \times 87.0)$

## Calculate the atomic mass for the problems below. SHOW YOUR WORK.

11) The element copper has naturally occurring isotopes with mass numbers of 63 and 65 . The relative abundance and atomic masses are $69.2 \%$ and 62.93 amu and $30.8 \%$ and 64.93 amu . Calculate the average atomic mass of copper.
12) Calculate the atomic mass of bromine. The two isotopes of bromine have atomic masses and relative abundance of $78.92 \mathrm{amu}(50.69 \%)$ and 80.92 amu ( $49.31 \%$ ).
13) Determine the average atomic mass of the following. $80 \%{ }^{127} \mathrm{I}, 17 \%^{126} \mathrm{I}$ and $3.0 \%{ }^{128} \mathrm{I}$.

CHALLENGE ( +1 on homework if this is completed correctly!): Lithium has 2 naturally occurring isotopes. Lithium -6 has an atomic mass of 6.015 amu . Lithium -7 has an atomic mass of 7.016 amu . The average atomic mass of Lithium is 6.941 amu . What is the percent abundance of Lithium 7 ?

