CHAPTER 1: MATTER

1. Based on a mass spectrum analysis of copper was found to have two isotopes ^{63}Cu and ^{65}Cu. If the ratio of the relative abundances of both isotopes is 1 :2.235. Calculate average atomic mass of Copper.

   A. 64.80 u C. 64.01 u

   B. 64.38 u D. 64.62 u

2. Boron obtained from borax deposits in Death Valley consists of two isotopes. They are boron-10 and boron-11 with atomic masses of 10.013 amu and 11.009 amu, respectively. The atomic mass of boron is 10.81 amu. What is the percentage abundance of boron-11?

   A. 80.02% C. 55.42%

   B. 19.98% D. 44.58%

3. Given the following table:

Isotopes	Mass (amu)	Percentage abundance
^{107}Ag	106.91	51.50
^{109}Ag	108.90	48.50

   Calculate the average atomic mass of silver.

   A. 107.88 amu C. 108.77 amu

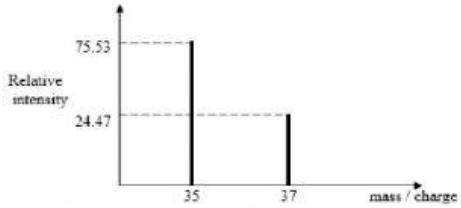
   B. 170.88 amu D. 178.00 amu

4. In a study, it is found that the copper abundance consists of a mixture of 69.09% Cu and 30.91% Cu. If the respective isotopic masses are 62.93 amu and 64.93 amu, what is the relative atomic mass of copper?

   A. 63.49 amu C. 64.31 amu

   B. 63.55 amu D. 64.54 amu

5. Mass spectrum of chlorine is shown below. Based this figure, determine the relative atomic mass for Chlorine.



   A. 35.49 C. 35.33

   B. 36.23 D. 36.72

6. Analysis of a gaseous hydrocarbon gives the following mass 85.7% C, 14.3% H. Determine the empirical formula of the hydrocarbon.

   A. CH_2 C. CH_3

   B. CH D. C_2H_3

7. The percent composition by mass of a compound is 76.0% C, 12.8% H, and 11.2% O. The molar mass of this compound is 284.5 g/mol. What is the molecular formula of the compound?

   A. $C_9H_{18}O$ C. $C_{20}H_{12}O_2$

   B. $C_{16}H_{28}O_4$ D. $C_{18}H_{36}O_2$

8. A 0.8715 g sample of sorbic acid, a compound first obtained from the berries of a certain ash tree, is burned completely in oxygen to give 2.053 g of carbon dioxide and 0.5601 g of water. The empirical formula of sorbic acid is

   A. CH_2O C. CH_4O_3

   B. C_3H_4O D. $C_3H_4O_2$

9. A chemistry student determined the empirical formula for titanium sulfide (Ti_xS_y). To do so, he reacted titanium with excess sulfur in a crucible. The data that he recorded are shown below:

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