Average Atomic Mass

olve the following problems on your own paper. Show all work in the manner directed by your teacher in order to receive credit.

1. The element Eu occurs naturally as a mixture of 47.82% ^{151}Eu, whose mass is 150.9 u and 52.18% ^{153}Eu, whose mass is 152.9 u. Calculate the average atomic mass of Eu.

2. Three isotopes of magnesium occur in nature. Their abundances and masses are listed below. Use this information to calculate the average atomic mass of magnesium.

Isotope	% Abundance	Mass (u)
^{24}Mg	78.70	23.98504
^{25}Mg	10.13	24.98584
^{26}Mg	11.17	25.98259

3. Naturally occurring chlorine consists of two isotopes: 75.53% of the atoms in a sample are ^{35}Cl, mass = 34.96885 u, and the other 24.47% are ^{37}Cl, mass = 36.96590 u. Calculate the average atomic mass of chlorine.

4. Naturally occurring silicon consists of three isotopes with the abundances indicated below. From the masses and relative abundances of these isotopes, calculate the average atomic mass of naturally occurring silicon.

Isotope	Mass (u)	% Abundance
^{28}Si	27.97693	92.21
^{29}Si	28.97649	4.70
^{30}Si	29.97376	3.09

5. Find the average atomic mass of silver if 51.83% of the silver atoms are ^{107}Ag with a mass of 106.905 u and the rest are ^{109}Ag with a mass of 108.905 u.

6. Use the masses and relative abundances of the isotopes of krypton given below to find the average atomic mass of krypton.

Isotope	Mass (u)	% Abundance
^{78}Kr	77.920	0.350
^{80}Kr	79.916	2.27
^{82}Kr	81.913	11.56
^{83}Kr	82.914	11.55
^{84}Kr	83.912	56.90
^{86}Kr	85.911	17.37

7. Naturally occurring lead is composed of four isotopes. Their abundances and mass are given below. Calculate the average atomic mass of lead.

Isotope	Mass (u)	% Abundance
^{204}Pb	203.973	1.48
^{206}Pb	205.9745	23.6
^{207}Pb	206.9759	22.6
^{208}Pb	207.9766	52.3

8. Naturally occurring tellurium has the following isotopic abundances:

Isotope	% Abundance	Mass (u)
^{120}Te	0.09	119.90
^{122}Te	2.46	121.90
^{123}Te	0.87	122.90
^{124}Te	4.61	123.90
^{125}Te	6.99	124.90
^{126}Te	18.71	125.90
^{128}Te	31.79	127.90
^{130}Te	34.48	129.91

Calculate the average atomic mass of tellurium.

9. The metallic element chromium has four stable isotopes:

Isotope	Mass (u)	% Abundance
^{50}Cr	49.9461	4.35
^{52}Cr	51.9405	83.79
^{53}Cr	52.9407	9.50
^{54}Cr	53.9389	2.36

Calculate the average atomic mass of chromium.

10. Assume that element Uus is synthesized and that it has the following stable isotopes:

Isotope	Mass (u)	% Abundance
^{116}Uus	115.903	34.60
^{117}Uus	116.784	21.20
^{118}Uus	117.861	44.20

What is the value of the atomic mass that would be listed on the periodic table?

11. Calculate the estimated average atomic mass of lithium if the isotopic composition is 7.42% lithium-6 and 92.58% lithium-7.

12. If an element consists of 92.21% of atoms with a mass number of 28, 4.70% of atoms with a mass number of 29, and 3.09% of atoms with a mass number of 30, what is the estimated average atomic mass of the element?