

NAME _____

Average Atomic Mass Worksheet: show all work.

1) Rubidium is a soft, silvery-white metal that has two common isotopes, ^{85}Rb and ^{87}Rb . If the abundance of ^{85}Rb is 72.2% and the abundance of ^{87}Rb is 27.8%, what is the average atomic mass of rubidium?

2) Uranium is used in nuclear reactors and is a rare element on earth. Uranium has three common isotopes. If the abundance of ^{234}U is 0.01%, the abundance of ^{235}U is 0.71%, and the abundance of ^{238}U is 99.28%, what is the average atomic mass of uranium?



3) Titanium has five common isotopes: ^{46}Ti (8.0%), ^{47}Ti (7.8%), ^{48}Ti (73.4%), ^{49}Ti (5.5%), ^{50}Ti (5.3%). What is the average atomic mass of titanium?



4) Why is the mass in amu of a carbon-12 atom reported as 12.011 in the periodic table of the elements?

5) Naturally occurring chlorine that is put in pools is 75.53 percent ^{35}Cl (mass = 34.969 amu) and 24.47 percent ^{37}Cl (mass = 36.966 amu). Calculate the average atomic mass.



6) Copper used in electric wires comes in two flavors (isotopes): ^{63}Cu and ^{65}Cu . ^{63}Cu has an atomic mass of 62.9298 amu and an abundance of 69.09%. The other isotope, ^{65}Cu , has an abundance of 30.91%. The average atomic mass between these two isotopes is 63.546 amu. Calculate the actual atomic mass of ^{65}Cu .

7) Magnesium consists of three naturally occurring isotopes. The percent abundance of these isotopes is as follows: ^{24}Mg (78.70%), ^{25}Mg (10.13%), and ^{26}Mg (11.70%). The average atomic mass of the three isotopes is 24.3050 amu. If the atomic mass of ^{25}Mg is 24.98584 amu, and ^{26}Mg is 25.98259 amu, calculate the actual atomic mass of ^{24}Mg .

8) Complete the table

Isotope	Mass (amu)	Relative Abundance (%)
Neon-20	19.992	90.51
Neon-21	20.994	
Neon-22		9.22
	Avg. Atomic Mass =	Total %:

Average Atomic Mass Worksheet – Solutions

1) Rubidium has two common isotopes, ^{85}Rb and ^{87}Rb . If the abundance of ^{85}Rb is 72.2% and the abundance of ^{87}Rb is 27.8%, what is the average atomic mass of rubidium?

85.56 amu

2) Uranium has three common isotopes. If the abundance of ^{234}U is 0.01%, the abundance of ^{235}U is 0.71%, and the abundance of ^{238}U is 99.28%, what is the average atomic mass of uranium?

237.98 amu

3) Titanium has five common isotopes: ^{46}Ti (8.0%), ^{47}Ti (7.8%), ^{48}Ti (73.4%), ^{49}Ti (5.5%), ^{50}Ti (5.3%). What is the average atomic mass of titanium?

47.92 amu

4) Why is the mass in amu of a carbon-12 atom reported as 12.011 in the periodic table of the elements?

The masses on the periodic table are the average mass of all isotopes and their abundances found in the universe. Although carbon-12 weighs exactly 12 amu, the periodic table reports that the mass is 12.011 because we are taking into consideration the abundances and masses of the other two carbon isotopes (carbon-13 and carbon-14).

5) Naturally occurring chlorine that is put in pools is 75.53 percent ^{35}Cl (mass = 34.969 amu) and 24.47 percent ^{37}Cl (mass = 36.966 amu). Calculate the average atomic mass.

35.46 amu

6) Copper used in electric wires comes in two flavors (isotopes): ^{63}Cu and ^{65}Cu . ^{63}Cu has an atomic mass of 62.9298 amu and an abundance of 69.09%. The other isotope, ^{65}Cu , has an abundance of 30.91%. The average atomic mass between these two isotopes is 63.546 amu. Calculate the actual atomic mass of ^{65}Cu .

$^{65}\text{Cu} = 64.9278$ amu

7) Magnesium consists of three naturally occurring isotopes. The percent abundance of these isotopes is as follows: ^{24}Mg (78.70%), ^{25}Mg (10.13%), and ^{26}Mg (11.7%). The average atomic mass of the three isotopes is 24.3050 amu. If the atomic mass of ^{25}Mg is 24.98584 amu, and ^{26}Mg is 25.98259 amu, calculate the actual atomic mass of ^{24}Mg .

$^{24}\text{Mg} = 23.98504$ amu

8) Complete the table

Isotope	Mass (amu)	Relative Abundance (%)
Neon-20	19.992	90.51
Neon-21	20.994	0.27
Neon-22	21.991	9.22
	Avg. Atomic Mass = 20.179	Total %: 100.00