NATURAL ABUNDANCE AND AVERAGE ATOMIC MASS WORKSHEET

Answer the following questions.

1. 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 (U)?

2. Chlorine (Cl) is 75.53 percent ^{35}Cl (mass = 34.969 amu) and 24.47 percent ^{37}Cl (mass = 36.966 amu). Calculate its average atomic mass.

3. Magnesium (Mg) consists of three naturally occurring isotopes whose abundance is ^{24}Mg (78.70%), ^{25}Mg (10.13%), and ^{26}Mg (11.7%). Calculate the average atomic mass of Mg.

4. Rubidium (Rb) has two 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?

Name : _____ Date : _____

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Answers

1. 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 (U)?

Average atomic mass of U = (234 x 0.0001) + (238 x 0.9928) = 0.0234 + 236.2864 = 236.3098 amu

2. Chlorine (Cl) is 75.53 percent ^{35}Cl (mass = 34.969 amu) and 24.47 percent ^{37}Cl (mass = 36.966 amu). Calculate its average atomic mass.

Average atomic mass of Cl = (34.969 x 0.7573) + (36.966 x 0.2447) = 26.4820237 + 9.0455802 = 35.5 amu

3. Magnesium (Mg) consists of three naturally occurring isotopes whose abundance is ^{24}Mg (78.70%), ^{25}Mg (10.13%), and ^{26}Mg (11.7%). Calculate the average atomic mass of Mg.

Average atomic mass of Mg = (24 x 0.787) + (25 x 0.1013) + (26 x 0.117) = 18.888 + 2.5325 + 3.042 = 24.46 amu

4. Rubidium (Rb) has two 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?

Average atomic mass of Rb = (85 x 0.722) + (87 x 0.278) = 61.37 + 24.186 = 85.556 amu