

3.091 Fall Term 2004

Homework Quiz #1B

Solution outline

- (a) Magnesium has three isotopes, ^{24}Mg , ^{25}Mg , and ^{26}Mg . For the cation, Mg^{2+} , of the heaviest isotope, ^{26}Mg , specify the following:

number of protons, $n_p = 12$

number of electrons, $n_e = 10$

number of neutrons, $n_n = 14$

- (b) An internet website is quoting the following values for the natural abundance of each isotope:

^{24}Mg 79%

^{25}Mg 10%

^{26}Mg 11%

Does this distribution appear to be accurate? Explain with the aid of a simple calculation.

Let's check to see if the alleged isotopic distribution is consistent with the value of the atomic mass of Mg as given in your periodic table.

$$(24 \times 0.79) + (25 \times 0.10) + (26 \times 0.11) = 24.32$$

Your PT gives a value of 24.3050.

Conclusion: the values posted at the internet website appear to be accurate.