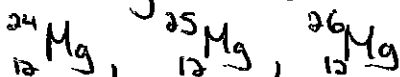


CH 4 Review Problems p. 129-130 # 62, 64, 73, 78, 114

62. What do the superscript and subscript in the notation ${}^{40}_{19}\text{K}$ mean?
 40 = atomic mass # (# of protons + # of neutrons)
 19 = atomic # (# of protons)

64. Are the following elements isotopes of each other? Explain.



Yes, they are isotopes of each other. They all have the same atomic # (12) which means they all have 12 protons. Their mass #'s differ, so they have different amounts of neutrons. Magnesium-24 has 12 neutrons, Magnesium-25 has 13 neutrons and Magnesium-26 has 14 neutrons.

73. How many electrons, protons, and neutrons are contained in each atom?

a) ${}^{132}_{55}\text{Cs}$: 55 protons, 55 electrons, 77 neutrons

b) ${}^{59}_{27}\text{Co}$: 27 protons, 27 electrons, 32 neutrons

c) ${}^{163}_{69}\text{Tm}$: 69 protons, 69 electrons, 94 neutrons

d) ${}^{70}_{30}\text{Zn}$: 30 protons, 30 electrons, 40 neutrons

78. Data for chromium's four naturally occurring isotopes are provided below. Calculate chromium's atomic mass.

Isotope	% Abundance	Mass (amu)	Avg Mass
Cr-50	4.35	49.946	$(49.946)(.0435) + (51.941)(.8379) +$ $(52.941)(.0950) + (53.939)(.0236)$ Avg Mass = 51.996 = <u>52.0 amu</u>
Cr-52	83.79	51.941	
Cr-53	9.50	52.941	
Cr-54	2.36	53.939	

114 Indium has two naturally occurring isotopes and an atomic mass of 114.818 amu. In-113 has a mass of 112.904 amu and an abundance of 4.3%. What is the identity and percent abundance of indium's other isotopes.

Isotope	Mass	%	
In-113	112.904	4.3%	Avg Mass = 114.818
X	?	(100-4.3) = 95.7%	

$$\text{Mass A} \left(\frac{\%A}{100} \right) + \text{Mass B} \left(\frac{\%B}{100} \right) = \text{Avg Mass}$$

$$112.904 (.043) + X (.957) = 114.818$$

$$4.855 + .957x = 114.818$$

$$.957x = 109.963$$

$$\boxed{x = 114.904}$$

The other isotope is In-115. It has a mass of 114.904 amu and is 95.7% abundant.