Isotopes 1

1. Complete the following table for the neutral isotopes below:

Isotope Name	Isotope Symbol	Atomic #	Mass #	# protons	# electrons	# neutrons
phosphorus-31	$^{31}_{15}P$	15	31	15	15	16
Cobalt-58	$^{58}_{27}Co$	27	58	27	27	31
Cobalt – 60	$^{60}_{27}Co$	27	60	27	27	33
Astatine-208	$^{208}_{85}At$	85	208	85	85	123

2. Rubidium has two naturally-occurring isotopes: Rb-85 (isotopic mass = 84.912 u) and Rb-87 (isotopic mass = 86.909 u). Calculate the average atomic mass of Rubidium if Rubidium-85 makes up 72.17% of natural Rubidium. (Compare this to the value given on the periodic table.)

Rb-85 = 72.17%
Rb-87 = 27.83%

$$Avg. \ atomic \ Mass = (0.7217)(84.912u) + (0.2783)(86.909u)$$

$$= 61.28 + 24.19 = \boxed{85.47 \ u}$$

(Matches Avg. Atomic Mass on the P.T.)

3. Naturally occurring bromine is composed of two isotopes, Br-79 with an isotopic mass of 78.918 amu, and Br-81, with an isotopic mass of 80.916 amu. Calculate the percent abundance of both Bromine isotopes. Report the final answers with 4 significant figures.

$$(78.918)x + (80.916)(1-x) = 79.90$$

$$78.918x + 80.916 - 80.916x = 79.90$$

$$-1.998x = -1.016$$

$$x = 0.5085$$

$$\boxed{50.85\% \ Br-79 \quad 49.15\% \ Br-81}$$