Name _____

Period ____   Date ___/___/___

2 • Atoms and Elements

Isotopes

21. Give the mass number of each of the following atoms:
     (a) an iron atom with 30 neutrons
     (b) an americium atom with 148 neutrons
     (c) a tungsten atom with 110 neutrons

23. Give the complete symbol ($^A_Z X$) for each of the following atoms:
     (a) nitrogen with 8 neutrons
     (b) zinc with 34 neutrons
     (c) xenon with 75 neutrons

25. How many electrons, protons, and neutrons are there in an atom of:
     (a) carbon-13, ^{13}C

     (b) copper-63, ^{63}Cu

     (c) bismuth-205, ^{205}Bi

27. Fill in the blanks in the table (one column per element).

Symbol	^{65}Cu	^{86}Kr		
Number of protons			78	
Number of neutrons			117	46
Number of electrons in the neutral atom				36
Name of element				

29. Radioactive americium-241 is used in household smoke detectors and in bone mineral analysis. Give the number of electrons, protons, and neutrons in an atom of americium-241.

31. Which of the following are isotopes of element X, with atomic number of 9: $^{19}_{9}X$, $^{20}_{9}X$, $^{9}_{18}X$, and $^{21}_{9}X$.

33. Verify that the atomic mass of magnesium is 24.31 amu, given the following information:
     ^{24}Mg, mass = 23.985042 amu; percent abundance = 78.99%

     ^{25}Mg, mass = 24.985837 amu; percent abundance = 10.00%

     ^{26}Mg, mass = 25.982593 amu; percent abundance = 11.01%

35. Copper has two stable isotopes, ^{63}Cu and ^{65}Cu, with masses of 62.939598 amu and 64.927793 amu, respectively. Calculate the percent abundances of these isotopes of copper.

37. Strontium has four stable isotopes, Strontium-84 has a very low natural abundance, but ^{86}Sr, ^{87}Sr, and ^{88}Sr are all reasonably abundant. Which of these more abundant isotopes predominates?