Name Key

Study Guide Chapters 4 & 5

1. Complete the chart below comparing historical chemists and their work.

	Part of the atom discovered	Their picture of an atom
Democritus	indivisible	
John Dalton	atomic theory	
J.J. Thomson	electrons	
Rutherford	nucleus	
Niels Bohr	energy levels	
Schrodinger	orbitals	

Plato Elements 

2. List the charge, mass, and location of all three subatomic particles.
proton, +1, 1amu ; neutron 0, 1amu; electron -1, very small mass

3. Use your periodic table to fill in the following table:

	C-14	Cl-35	Cu-65	Ca-40
# of protons	6	17	29	20
# of electrons	6	17	29	20
# of neutrons	8	18	36	20
mass #	14	35	65	40

4. What do these values represent?
   a. atomic number
   - number of protons
   b. average atomic mass
   - weighted average of all isotope masses based on abundance

5. Answer these questions in terms of numbers of subatomic particles, and atomic symbols.
   a. How are two isotopes similar?
   - same number of protons & electrons
   - same element symbol
   b. How do they differ?
   - different number of neutrons
   - different mass numbers

7. Calculate the average atomic mass of magnesium based on the information below.

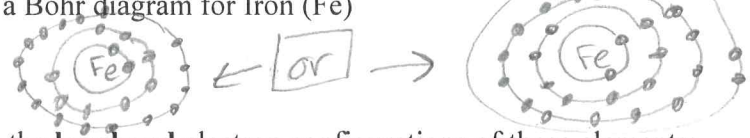
Isotope	% Abundance	Atomic Mass
Mg-24	78.70%	23.985 amu
Mg-25	10.13%	24.986 amu
Mg-26	11.17%	25.983 amu

.7870 × 23.985 = 18.88
.1013 × 24.986 = 2.531
.1117 × 25.983 = 2.902
+
24.313 amu

6. Fill in the following table about sublevels

Sublevel	Sketch shape	# of orbitals per sublevel	maximum # of electrons per sublevel	First energy level with this sublevel
s		1	2	1
p		3	6	2
d		5	10	3
f		7	14	4

7. Draw a Bohr diagram for Iron (Fe)



(26 electrons)

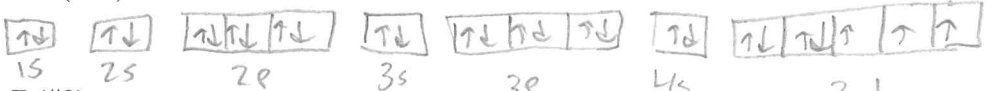
8. Write the **longhand** electron configurations of these elements:
   a. Cl (#17) $1s^2 2s^2 2p^6 3s^2 3p^5$

   b. Zn (#30) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$

9. Write the **shorthand** electron configuration of these elements:
   a. Pd (#46) $[Kr]\ 5s^2 4d^8$

   b. Pb (#82) $[Xe]\ 6s^2 4f^{14} 5d^{10} 6p^2$

10. Draw the **orbital diagrams** of these elements:
    a. Co (#27)



    b. F (#9)