CHM 1010 **GAGE**

Worksheet for Atomic Structure and Properties

1. List everything you know about the element sulfur using the periodic table.

2. Write the simple atom diagrams and the electron configurations (full and noble gas convention) for the following atoms and ions:

calcium	iron (II)	cobalt
chlorine	iron (III)	potassium ion
tin	phosphide ion	titanium

3. For the set of substances below, group species that are isoelectronic:

Ar Na^+ Cl^- Sr^{2+} P^{3-} Mg^{2+} Kr As^{3-} S^{2-} Ti^{4+} Ne

4. Determine the elements that have the following as the last part of their electron configurations:
a. $4s^23d^8$ b. $3p^4$ c. $6s^1$ d. $4s^13d^5$ e. $5p^2$

5. Explain the contributions of the following discoveries or persons to the development of the current atomic model/theory:

Dalton	discovery of radioactivity
Bohr	Rutherford's gold foil experiment
Heisenberg	atomic emission line specta
de Broglie	Schroedinger

6. Place the following sets of atoms in order from smallest to largest radius and explain why. (Don't just say "because the trend is...")

a.	Mn	Ca	Br	As
b.	Te	S	O	Se
c.	S	F	O	Si

7. Place the following atoms in order from largest to smallest first ionization potential (energy) and explain the ranking:

a.	Sr	Ba	Be	Mg
b.	Br	I	F	Cl

8. How does the size of potassium compare to a potassium ion. Why? Answer the same question for sulfur and the sulfide ion.

9. How is electron affinity the same as and different from ionization energy? Which elements have the highest electron affinity? Why?