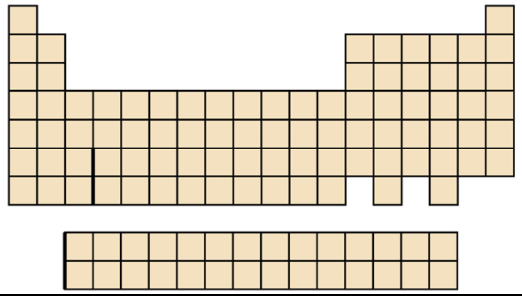
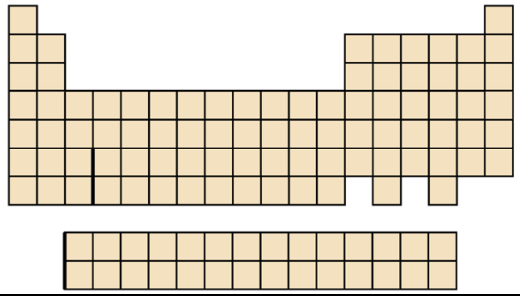
Inorganic Chemistry with Doc M.

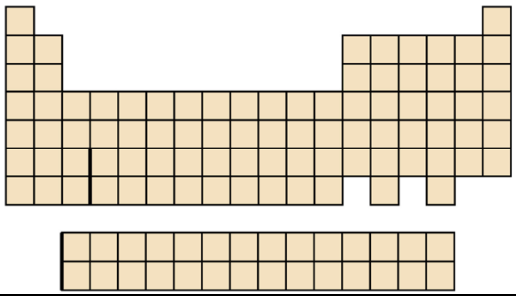
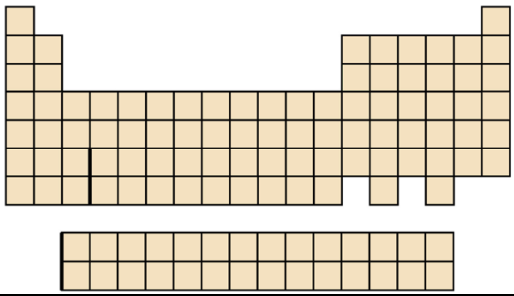
Fall Semester, 2011

Day 1. Periodic Trends

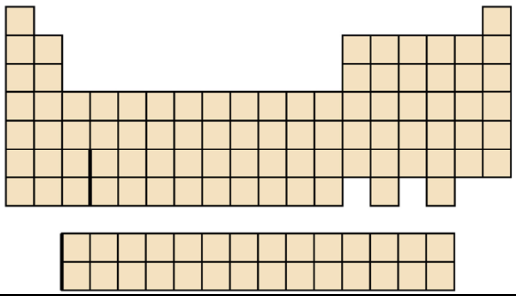
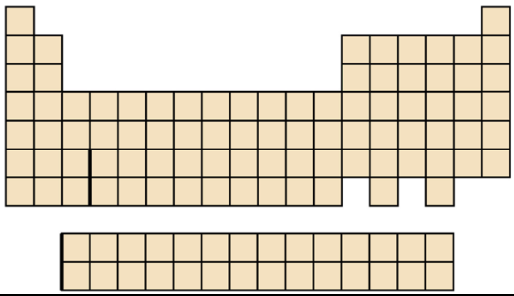
Name(s):	Element:

1. Atomic radius (size): Our work:	1. Atomic radius (size): after discussion
	

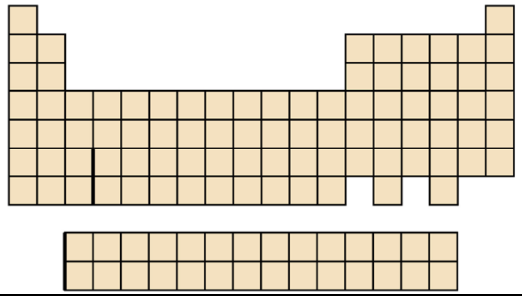
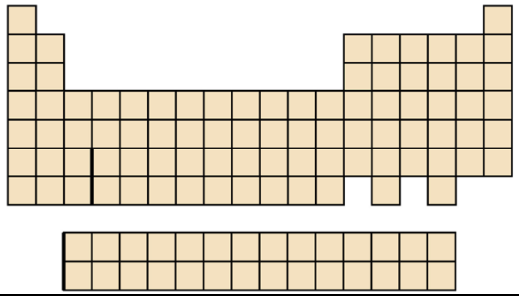
Notes:

2. First ionization energy: Our work:	1. First ionization energy.: after discussion
	

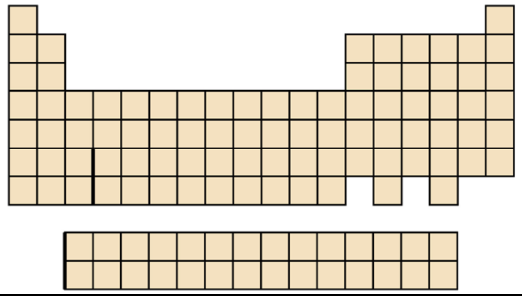
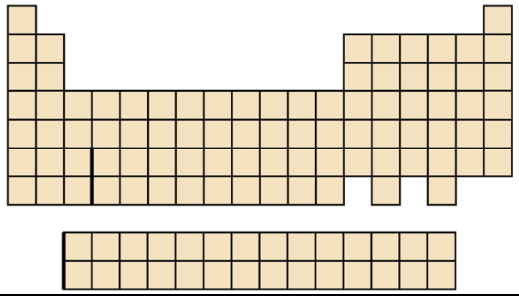
Notes:

3. Effective nuclear charge: Our work:	3. Effective nuclear charge: after discussion
	

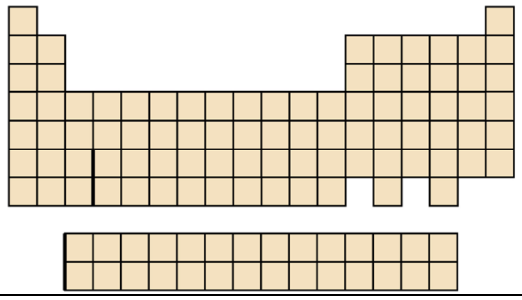
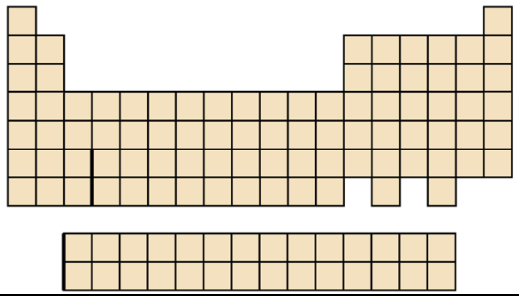
Notes:

4. Electronegativity: Our work:	4. Electronegativity: : after discussion
	

Notes:

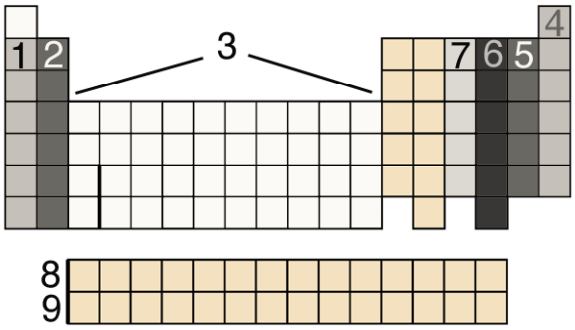
5. Electron affinity: Our work:	5. Electron affinity: after discussion
	

Notes:

6. Metallic character: Our work:	6. Metallic character: after discussion
	

Notes:.

7. Group Names:



1.

2.

3.

4.

5.

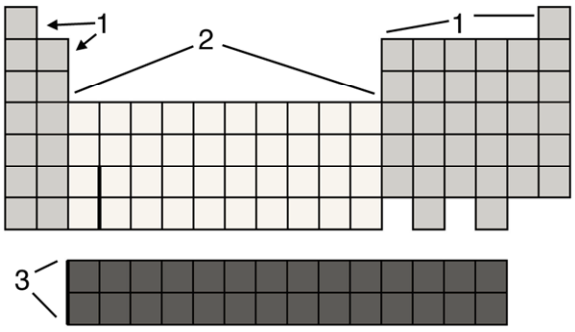
6.

7.

8.

9.

8. Group Block Names:

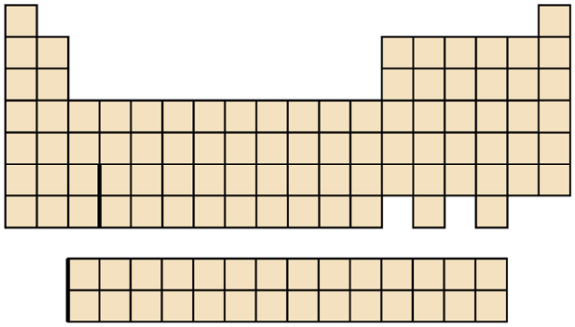


1.

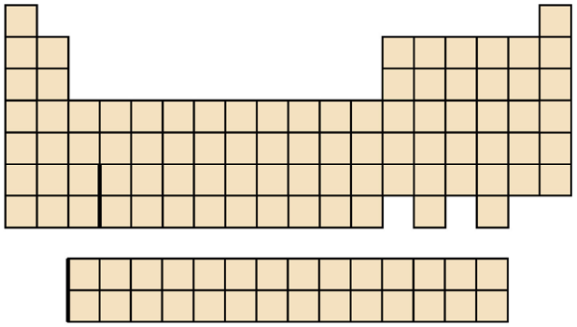
2.

3.

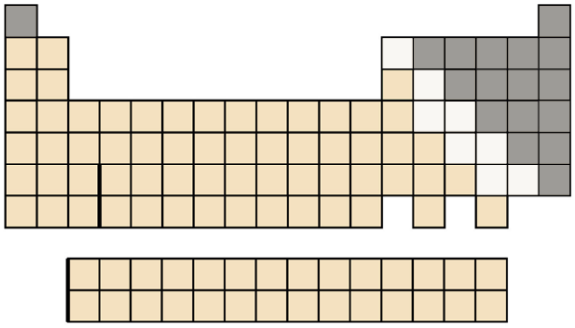
9. Old Group Numerical System:



9. New Group Numerical System:

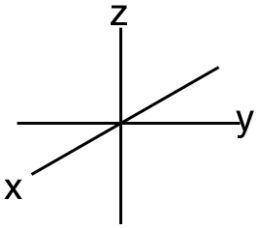
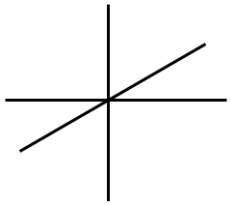
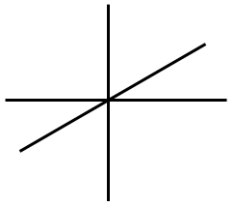
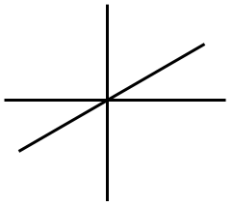
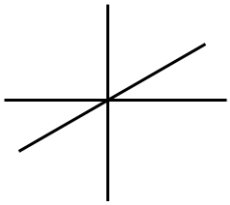
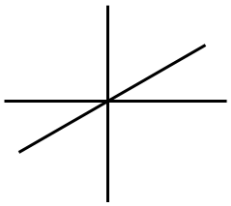
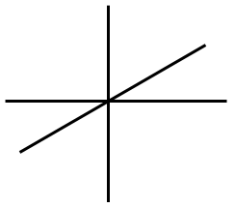
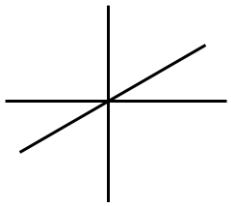
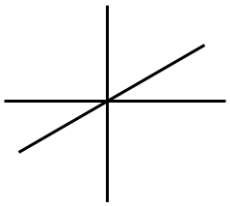
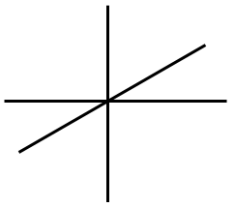


Note: Add the older group numbering system (1A – 8A and 1B – 10B) to the left periodic table (you can use Roman numerals instead if you prefer (IA – VIIIA, etc.) Add the modern numbering system (1 – 18) to the periodic table on the right. Note the correlation.

10. Periodic table by physical properties	
	

Part 2. The d-orbitals

Sketch the s-orbital, the three p-orbitals and the five d-orbitals on the Cartesian coordinates below. Label the orbits (e.g. p_x)

Cartesian coords 	 s-orbital	 p	 p	 p
 d	 d	 d	 d	 d

Review for ACS Final Exam in Inorganic Chemistry

Electron Configuration, Quantum Numbers and the Periodic Table

1. NaF_2 is not stable because:
   (a) The lattice energy would be greater than zero.
   (b) The electron affinity of fluorine is too small
   (c) The ionization energy of sodium is too large.
   (d) Na^{+2} is too small to form a stable ionic lattice.
   (e) The electronegativity of fluorine is too large.

2. The maximum number of electrons with n = 5 on any given atom is:
   (a) 16
   (b) 18
   (c) 25
   (d) 32
   (e) 50

3. How many spherical nodes are expected for the 5f orbitals?
   (a) 0
   (b) 1
   (c) 2
   (d) 3
   (e) 5

4. Element 120 is expected to be
   (a) an alkali metal
   (b) an alkaline earth
   (c) a transition metal
   (d) a post-transition metal
   (e) a non-metal

5. The element europium, Eu, is expected to have chemistry most similar to
   (a) tungsten
   (b) rhenium
   (c) osmium
   (d) iridium
   (e) platinum

6. Which of these elements is most likely to exhibit a +7 oxidation state?
   (a) tungsten
   (b) zirconium
   (c) sulfur
   (d) technetium
   (e) cadmium

7. The smallest value of n possible for a g-electron is
   (a) 4
   (b) 5
   (c) 6
   (d) 7
   (e) 8

Answers: C, E, B, B, D, D, B