

Chemistry 1A

Name: _____

Quantum Theory & Periodic Trends

1. What element is represented by the electronic configuration $1s^2 2s^2 2p^6 3s^2 3p^1$? _____

2. What elements are represented by the atomic orbital diagram where the 1s, 2s, 2p are full and the 3s has a variable number of electrons.

3. Draw the atomic orbital diagram for the following species: $1s^2 \quad 2s^2 \quad 2p^6 \quad 3s^?$ _____

Mn²⁺ _____

Cu _____

4. Write the electron configuration for the following elements and ions without using the noble gas core:

Cr _____

Si _____

Fe²⁺ _____

P³⁻ _____

5. Write the electron configuration for the following elements and ions using the noble gas core

Sn²⁺ _____

Br⁻ _____

6. What are the possible values of subsidiary quantum number (l) when n = 5?

7. What are the possible values for the magnetic quantum number (m) when (l) = 3?

8. In the ground state of selenium, how many electrons have:

n = 4 _____ b) l = 2 _____

m = 0 _____ d) l = 1 and m = +1 _____

9. List the 4 quantum numbers for all nine electrons of fluorine in order.

	n	l	m_l	m_s
1				
2				
3				
4				
5				
6				
7				
8				
9				

When looking at the periodic table, which atoms are smallest? Show examples and explain your answer.

When looking at isoelectronic ions, which ion will be the smallest? Show examples and explain your answer.