Chemistry 141 Name

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Quiz 7 (20 points) Monday, October 29, 2012

1. (3 points) What is the physical significance of the value ψ2? That is, what information does this value give us?

ψ2 represents the probability function and it tells us the region in space where an electron has a high probability of existing.

1. (4 points) What are the possible values of the angular momentum quantum number l ? What does the angular momentum quantum number tell us about an electron?

The angular momentum quantum number, l, can have integer values from n-1 to zero. The angular momentum quantum number tells type of sublevel (s,p,d or f) that the electron resides in.

1. (3 points) Write the complete electron configuration for an atom of silicon.

Si 1s2 2s2 2p6 3s2 3p2

1. (3 points) Write the shorthand electron configuration for a cobalt (II) ion.

Co2+ [Ar] 3d7

Remember the 4s electrons are lost first!

1. (3 points) What is the general trend in ionization energy as you move across a row in the periodic table? Explain.

Ionization energy increases as you move across the periodic table to the right. This is because the effective nuclear charge is increasing which means that the electrons are held more tightly.

1. (4 points) Arrange this series in order of increasing atomic radius: Se2–, Sr2+, Br–, Rb+, Kr. Explain your reasoning.

Because these species are all isoelectronic, meaning they have the same electron configuration, the species with more protons (and higher positive charge) will be smaller.

Thus Sr2+<Rb+<Kr<Br–<Se2–