CHM151 Quiz #8a 25 Pts Spring 2017 Name: Key

Formulas and Constants: $c = \lambda\upsilon$ $\Delta E = h\upsilon$ $c = 3.00 \times 10^{8}$ m/s $h = 6.626 \times 10^{-34}$ J·s

1. (3 Pts) Give the complete electron configuration for Se.

Se $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^4$

2. (8 Pts) Use the shorthand notation to write out the electron configuration for each of the following:

a. Zn [Ar] $4s^2 3d^{10}$

b. Ba [Xe] $6s^2$

c. Fe [Ar] $4s^2 3d^6$

d, V^{2+} [Ar] $3d^3$

3. (4 Pts) What is the wavelength of radiation having a frequency of 6.91×10^{14} s^{-1}?

$\lambda = \frac{c}{\nu} = \frac{3.00 \times 10^{8}\ m/s}{6.91 \times 10^{14}\ s^{-1}} = 4.34 \times 10^{-7}\ m$

4. (2 Pts) Is a Mg atom paramagnetic or diamagnetic?

5. (2 Pts) Identify the element with the electron configuration of $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$

V vanadium

6a. (6 Pts) Calculate the frequency of light have a wavelength of 478 nm? (n = 10^{-9})

$\nu = \frac{c}{\lambda} = \frac{3.00 \times 10^{8}\ m/s}{478 \times 10^{-9}\ m} = 6.28 \times 10^{14}\ s^{-1}$

b. What is its energy?

$E = h\nu = 6.626 \times 10^{-34}\ J \cdot s \times 6.28 \times 10^{14}\ s^{-1} = 4.16 \times 10^{-19}\ J$