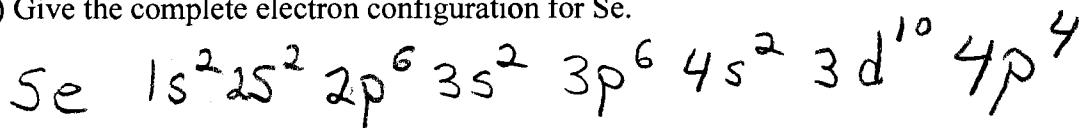
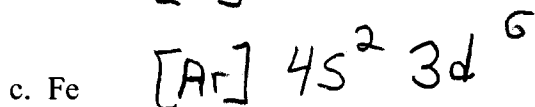
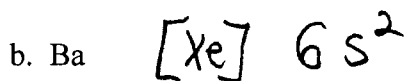
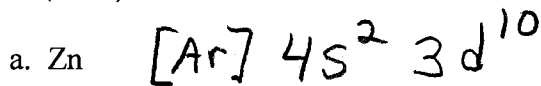


Formulas and Constants: $c = \lambda\nu$ $\Delta E = h\nu$ $c = 3.00 \times 10^8 \text{ m/s}$ $h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$

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



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

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

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

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? ($n = 10^{-9}$)

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

b. What is its energy?

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