
Workshop 8 – Quantum Mechanics

Show calculation setups and answers for all problems below.

1. An FM radio station has a frequency of 88.9 MHz (1 MHz = 10^6 Hz). Determine the wavelength (in nm).

2. Violet light has a wavelength of about 410 nm. What is its frequency (in Hz)?

3. An advertising sign gives off red light and green light.

A. Which light has the higher energy? Briefly explain below.

B. One of the colors has a wavelength of 680 nm, and the other has a wavelength of 500 nm. Identify which color has which wavelength. Explain your identifications below.

Red = _____

Green = _____

C. Which light has the higher frequency? Briefly explain below.

4. Write the symbols for three cations and three anions *isoelectronic* with neon:

Name: _____

Section: _____

5. Write complete and abbreviated electron configurations for each of the following atoms/ions:

A. S

Complete: _____

Abbreviated: _____

B. Nb

Complete: _____

Abbreviated: _____

C. Sb^+

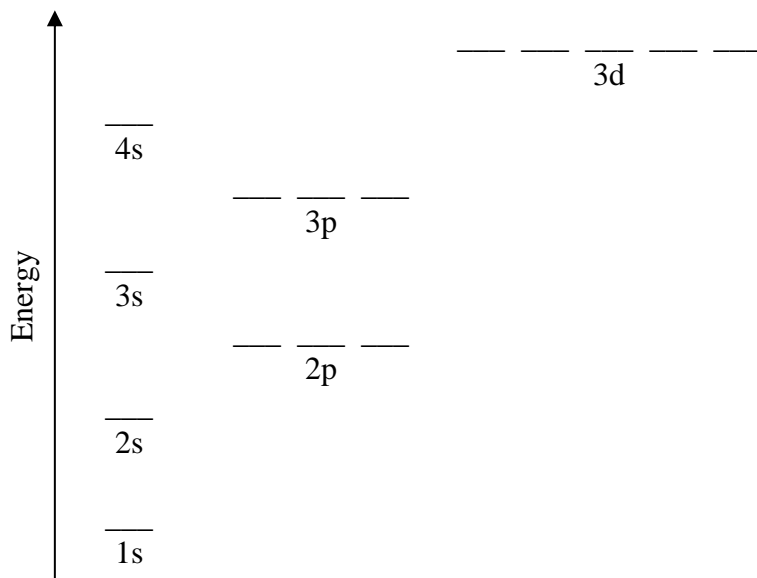
Complete: _____

Abbreviated: _____

6. Arrange the following forms of electromagnetic radiation in order of increasing energy:

- A. gamma rays from a supernova
- B. infrared rays from a hot plate
- C. ultraviolet light from the sun
- D. radiowaves from an MP3 player
- E. green light from chlorophyll

7. Complete the orbital energy diagram below for Co. How many unpaired electrons does the Co atom have?



unpaired electrons _____