

Workshop #2 10/07/15 Even Problems

2. A) 10; there are 5 orbitals in the d sublevel and each orbital can hold 2 electrons.

B) 2; the s sub orbital can hold 1 orbital with 2 electrons.

C) 18; the energy sublevel holds the s, p, and d orbitals which together hold 18 electrons

4. A) 3

D) 4

B) 7

E) 2

C) 4

The answers are determined by looking at how many electrons are in a particular element's HIGHEST energy sublevel.

6. Lithium: Paramagnetic

Barium: Diamagnetic

Nitrogen: Paramagnetic

Mercury: Diamagnetic

Nickel: Paramagnetic

Tellurium: Paramagnetic

When determining if an element has paramagnetism, look to see if the element has unpaired shells, if it does, it is paramagnetic.

$$8. \quad h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$$

$$c = 3.0 \times 10^8 \text{ m/s}$$

$$e = 1.602 \times 10^{-19} \text{ C}$$

$$E = \frac{hc}{\lambda} \quad E = \frac{(6.626 \times 10^{-34} \text{ J}\cdot\text{s})(3.0 \times 10^8 \text{ m/s})}{\lambda}$$

$$E = 1.99 \times 10^{-25} \text{ J}\cdot\text{m}$$

$$\lambda = \frac{hc}{E} \quad \lambda = \frac{1.99 \times 10^{-25} \text{ J}\cdot\text{m}}{1.602 \times 10^{-19} \text{ C}}$$

← This unit should be Joules/eV

$$\lambda = 1.243 \times 10^{-6} \text{ m} (10^9 \text{ nm})$$

$$\boxed{\lambda = 1243 \text{ eV}\cdot\text{nm}}$$

Derive the energy equation to solve for λ then convert from meters to nanometers to get answer in eV·nm.