Electronic Structure of Atoms Worksheet Answer Key

1. a) 4.6×10^{-19} J b) 6.94×10^{14} s^{-1} c) 4.32×10^{-7} m d) 5.68×10^{-19} J
2. 4.34×10^{-7} m = 434 nm
3. $E_{XRay} = 1.29 \times 10^{-15}$ J; $E_{Microwave} = 3.89 \times 10^{-23}$ J (Xrays have 3.32×10^{7} times more energy)

Electronic Structure Worksheet Answer Key

1. 4.58×10^{-19} J
2. 2.42×10^{-14} m/s
3. 7×10^{-19} J
4. n = 2 $\ell = 1$ $m_\ell = 0$; n = 2 $\ell = 1$ $m_\ell = -1, 0, +1$
5. 3.98×10^{11} Hz
6. 4.74×10^{-19} J
7. 2s = 1, 3d = 5
8. –1, 0, +1

Chapter 6 Homework Problems

1. Inversely proportional; 400-700 nm
2. B<C<E<A<D
3. a)0.344 m; b) 4.62×10^{-14} Hz; c) microwave/TV range, is visible (not detected)
4. 455 nm indigo
5. a) 2.48×10^{-19} J; b) 5.2×10^{-19} J; c) 2.84×10^{15} s^{-1}
6. a) 2.3×10^{-20} J and 1.2×10^{-18} J; b) 8.7μm is IR and 160 nm is UV
7. 40 photons (must be a whole #)
8. 8. 1.50×10^{-6} m; yes, it is in the IR region
9. a) 4.60×10^{-19} J; b) 6.94×10^{14} s^{-1}; c) 432 nm; d) 65.2 kJ/mol
10. Bohr theory states that only certain energy changes are allowed within an atom. These allowed changes correspond to specific wavelengths in the line spectrum.
11. a) absorbed; b) emitted; c) absorbed
12. a) -2.04×10^{-18} J and 9.74×10^{-8} m emitted
    b) -1.55×10^{-19} J and 1.28×10^{-6} m; emitted
    c) -4.84×10^{-19} J and 4.11×10^{-7} m emitted
13. 1.22×10^{-7} m UV
14. a) 25 m/s, 2.0×10^{-38} m; b) 0.14 kg, 40 m/s, 1.2×10^{-34}m;
    c) 6.64×10^{-27} kg/He atom, 1.2×10^{-13} m
15. a) $\ell = 3,2,1,0$; b) $m_\ell = -3,-2,-1,0,+1, +2,+3$