

$$h=6.63 \times 10^{-34} \text{ Js}$$

Practice Quiz – Quantum Theory of the Atom

1. Which of these types of radiation has the highest frequency?
a. radio waves b. infrared c. microwaves d. ultraviolet e. visible

2. What is the energy of 1.00 mole of photons with a wavelength of 375 nm?

3. Einstein's work on the photoelectric effect provided support for the equation:
a. $KE=1/2mv^2$
b. $E=h\nu$
c. $E=mc^2$
d. $v=c/\lambda$
e. none of these

4. Match the following:

| Quantum Number | Property |
|----------------|---------------|
| n | electron spin |
| m_l | shape |
| m_s | size |
| l | orientation |

5. Which of the following is not a possible combination of quantum numbers:
a. 4 2 -1 +1/2
b. 5 4 4 -1/2
c. 3 3 -2 +1/2
d. 4 0 0 -1/2

6. All of the following statements are consistent with the quantum theory of the atom except:
a. Black body radiation produces emissions that depend only on temperature.
b. An intense beam of light will always eject some electrons off of a metal.
c. An ionized metal atom will emit several very specific frequencies of EMR when heated.
d. The energy of a photon increases as its frequency increases.

7. Which of the following events might change the wavelength of a beam of light:
a. transmission of light through a solution
b. absorption of light and subsequent emission of light
c. reflection of light in a mirror
d. the scattering of light on the particles in a colloid such as milk

8. What is happening in the atom to produce atomic emission spectra?