Name: _____

Spectra Worksheet

1. The modern model of the atom shows that electrons are

   (a) orbiting the nucleus in fixed paths
   (b) found in regions called orbitals
   (c) combined with neutrons in the nucleus
   (d) located in a solid sphere covering the nucleus

2. Which electron configuration represents a neutral atom of carbon in an excited state?

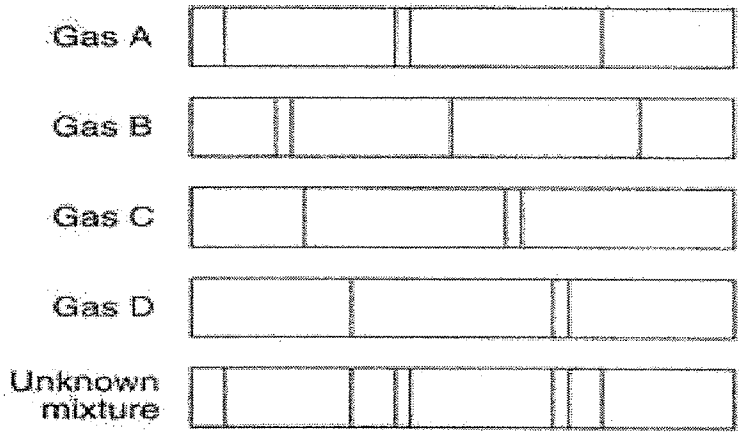
   (a) $1s^2 2s^2 2p^2$
   (b) $1s^2 2s^2 2p^3$
   (c) $1s^2 2s^1 2p^3$
   (d) $1s^2 2s^2 2p^6$

3. Which electron transition represents a gain of energy?

   (a) from 2nd to 3rd shell
   (b) from 3rd to 2nd shell
   (c) from 2nd to 1st shell
   (d) from 3rd to 1st shell

4. When compared with the energy of an electron in the first shell of a carbon atom, the energy of an electron in the second shell of a carbon atom is (a) less (b) greater (c) the same

5. Many advertising signs depend on the production of light emissions from gas-filled glass tubes that are subjected to a high-voltage source. When light emissions are passed through a spectroscope, bright-line spectra are produced.



Identify the two gases in the unknown mixture. _____ _____

6. Explain how a bright-line spectrum is produced, in terms of *excited state* and *ground state.*

7. Explain the production of an emission spectrum in terms of the energy states of an electron.