Problems

Name _____

ON A SEPARATE SHEET OF PAPER, solve the following atomic problems using our models for the Bohr hydrogen atom and the properties of the periodic table.

1. Calculate the energy of the $n = 3$ energy level of a hydrogen atom:
   (*a*) in eV
   (*b*) in Joules (J)

2. How much energy is needed to move an electron in a hydrogen atom from the ground state ($n = 1$) to an ($n = 3$) excited state?

3. What frequency of light is emitted when an electron in a hydrogen atom jumps from an $n = 2$ energy level to the ground state ($n = 1$)?

4. How much energy is needed to completely remove an electron from the $n = 2$ energy level in a hydrogen atom?

5. How many valence electrons are found in each of the following atoms?
   (*a*) Na
   (*b*) P
   (*c*) Br
   (*d*) I
   (*e*) Te
   (*f*) Sr

6. Use the periodic table to identify the following elements as a metal, non-metal or semi-conductor.
   (*a*) Radon
   (*b*) Francium
   (*c*) Arsenic
   (*d*) Phosphorus
   (*e*) Hafnium
   (*f*) Uranium