Name _____ Period _____

Honors Chemistry Worksheet

The Bohr Model

Possibly useful information:
400 nm = 4000 Å = 4.00 x 10^{-7} m = 4.00 x 10^{-5} cm

For visible light:

Violet: 400 nm–450 nm	Blue: 450 nm–500 nm	Green: 500 nm–560 nm
Yellow: 560 nm–600 nm	Orange: 600 nm–640 nm	Red: 640 nm–750 nm

R = 109680 cm^{-1}

1. What happens when an electron drops from a higher energy level to the n = 2 level?

2. What causes an electron to jump from a low energy level to a higher one?

3. Using the lines below, draw and label arrows between the energy levels to show the radiaton emitted in the following series:

Series Name	Type of Radiation
A) Lyman	UV
B) Balmer	visible light
C) Pacshen	Near IR
D) Brackett	IR
E) Pfund	Far IR

(A) (B) (C) (D) (E)

n = 6 _____
n = 5 _____

n = 4 _____

n = 3 _____

n = 2 _____

n = 1 _____

4. Find the wavelengths (in nm) and the colors for the following transitions:

A) n = 3 to n = 2 A) λ = _____; color = _____

B) n = 4 to n = 2 B) λ = _____; color = _____

C) n = 5 to n = 2 B) λ = _____; color = _____

5. What type of radiation is emitted when and electron moves from…

   A) n = 2 to n = 1?

   B) n = 4 to n = 3?

   C) n = 5 to n = 3?

6. Suppose a UV photon is absorbed by an electron, raising it to the n = 6 level. Show three different ways it might return to its ground state. For each transition, name the type of radiation emitted, and if that radiation is visible light, name the color of that light.

	(A)	(B)	(C)	
n = 6				
n = 5	_____			Describe (A):
n = 4	_____			
n = 3	_____			
n = 2	_____			Describe (B):
n = 1	_____			Describe (C):