Electronic Structure Worksheet II Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Chem 140

See Figure 6.14 and equation 6.4



RH=1.096776e7 m-1 (Rydberg constant)

h = 6.626e-34 J s (Plank’s constant)

c = 3.0e8 m/s (speed of light)

1) Calculate the wavelength (**) associated with the spacing between the n1=2 and n2=4?

2) Calculate the wavelength (**) associated with the spacing between the n1=2 and n2=5?

3) Calculate the wavelength (**) associated with the spacing between the n1=2 and n2=6?

4) Calculate the energy associated with the n1=2 and n2=4 spacing…

5) Calculate the energy associated with the n1=2 and n2=5 spacing…

6) Calculate the energy associated with the n1=2 and n2=6 spacing…

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| spacing | n1 | n2 | **(exp) | **(calc) | E (J) |
|  | 2 | 3 | 656 nm |  |  |
|  | 2 | 4 | 486 nm |  |  |
|  | 2 | 5 | 434 nm |  |  |
|  | 2 | 6 | 410 nm |  |  |

Calculate the ***wavelength*** and ***energy*** associated with transitions ending in the ***n=1 level***.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| spacing | n1 | n2 | **(calc) | E (J) |
|  | 1 | 2 |  |  |
|  | 1 | 3 |  |  |
|  | 1 | 4 |  |  |
|  | 1 | 5 |  |  |
|  | 1 | 6 |  |  |

Calculate the ***wavelength*** and ***energy*** associated with transitions ending in the ***n=3 level***.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| spacing | n1 | n2 | **(calc) | E (J) |
|  | 3 | 4 |  |  |
|  | 3 | 5 |  |  |
|  | 3 | 6 |  |  |

Calculate the ***wavelength*** and ***energy*** associated with transitions ending in the ***n=4 level***.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| spacing | n1 | n2 | **(calc) | E (J) |
|  | 4 | 5 |  |  |
|  | 4 | 6 |  |  |