Chemistry 141 - 4076 Name .

Dr. Cary Willard

Quiz 7A (20 points) October 10, 2007

c = λν = 3.00 x 108 m/sec, E = hν, h = 6.626 x 10-34 J sec

1. (9 points) Chlorophyll, the green pigment found in plants, absorbs visible radiation in the red region (675 nm).
   1. What is the frequency of this radiation?
   2. What is the energy of this radiation?
   3. What is the energy of one mole of photons?
2. (6 points) Given a single electron atom with the following energy levels, determine the E for a transition from
   1. n=4 to n=6

— n = 6, −1 Joules

— n = 5, −2 Joules

— n = 4, −6 Joules

— n = 3, −12 Joules

— n = 2, −21 Joules

— n = 1, −35 Joules

* 1. n=3 to n=1

1. (2.5 points) What are some properties of light that make us believe it has some particle nature?
2. (2.5 points) What are some properties of electrons that make us believe they have some wave nature?

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Quiz 7B (20 points) October 10, 2007

c = λν = 3.00 x 108 m/sec, E = hν, h = 6.626 x 10-34 J sec

1. (9 points) Chlorophyll, the green pigment found in plants, absorbs visible radiation in the blue-violet region (440 nm).
   1. What is the frequency of this radiation?
   2. What is the energy of this radiation?
   3. What is the energy of one mole of photons?
2. (6 points) Given a single electron atom with the following energy levels, determine the E for a transition from
   1. n=3 to n=6

— n = 6, −1 Joules

— n = 5, −2 Joules

— n = 4, −6 Joules

— n = 3, −12 Joules

— n = 2, −21 Joules

— n = 1, −35 Joules

* 1. n=4 to n=1

1. (2.5 points) What are some properties of light that make us believe it has some particle nature?
2. (2.5 points) What are some properties of electrons that make us believe they have some wave nature?