

LECTURE 5

1. What is the energy of the light absorbed when an electron in a hydrogen atom makes the following transitions: (a) $n = 1$ to $n = 4$; (b) $n = 3$ to $n = 8$; (c) $n = 2$ to $n = 4$. Give your answers to 3 significant figures. (d) Draw an energy level diagram for hydrogen, and draw vertical arrows to indicate each of these three electron transitions on the diagram. Label your lines “a”, “b”, and “c”. *Refer to lecture 5 notes for examples of energy level diagrams.*
2. (a) Calculate the minimum energy photon that must be absorbed by a ground-state He^+ ion to ionize the remaining electron? Report your answer with three significant figures. (b) Calculate the wavelength of this photon.
3. Consider a quantum dot that emits yellow light with a wavelength of 537 nm.
(a) What is the energy difference between the initial and final energy levels resulting in this yellow light emission.
(b) If 2.00 mol of photons are emitted at 537 nm, what is the total energy emitted?
4. Briefly explain the meaning of the Schrodinger equation using language appropriate for readers of The New York Times Science Section. Limit your explanation to one or two sentences, which means you will need to select an aspect you feel is most important or exiting to share.

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5.111 Principles of Chemical Science
Fall 2014

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