

Chemistry Homework Wrapper:

Homework #1 (Graded) Due on 9/16/05

1. The goal of this homework assignment is to give you practice calculating excitation energies and visualizing the process of energy level change. Before you try to solve the problem, rate each of the following statements according to how true it is for you on a scale of 1 (not at all true) to 7 (very true).
 - (a) Before I began this assignment, the idea of quantized energy levels was familiar to me. 1 2 3 4 5 6 7
 - (b) Before I began this assignment, I felt confident I could accurately calculate energy levels. 1 2 3 4 5 6 7
 - (c) Before I began this assignment, I felt confident I could draw an energy level diagram? 1 2 3 4 5 6 7

2. The sun's atmosphere contains vast quantities of He^+ cations. These ions absorb some of the sun's thermal energy, promoting electrons from the He^+ ground state to various excited states. The energy of these excited states are called excitation energies and are measured relative to the ground state whose excitation energy is zero by definition. A He^+ ion in the fifth energy level may return to the ground state by emitting three successive photons: an infrared (IR) photon (wavelength = 1014 nm), a green photon (469 nm), and an X-ray (26 nm).
 - (a) Calculate the excitation energies for each of the levels occupied by the He^+ ion as it returns to the ground state.
 - (b) Draw an energy level diagram for He^+ cations that illustrates all the details of this cascade process.

3. After having completed this assignment, rate each of the following statements in terms of how true it is for you on a scale or 1 (not at all true) to 7 (very true).
 - (a) If I had to do an energy calculation for a different one-electron system on a test, I am confident I could do so. 1 2 3 4 5 6 7
 - (b) I understand how the idea of changing energy levels relates to other topics in the course. 1 2 3 4 5 6 7 Here is an example of another topic and why it is related to energy levels: _____

For more information on using exam wrappers in your course or for help in designing an exam wrapper handout, please contact Dr. Marsha Lovett, Associate Director, Faculty Development, Eberly Center for Teaching Excellence.

<http://www.cmu.edu/teaching/eberly/index.html>