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5.111 Principles of Chemical Science
Fall 2008

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5.111 Instructions and Logistics for Exam 1

Exam 1 covers lectures #1-9 (though the end of lecture #9 notes) and associated reading and problem sets #1-3. The exam is closed book and closed notes. You will need to bring your calculator. Please note that bringing calculators with any relevant physical or chemical information is cheating. The one and only exception is that if your calculator includes values for extremely common fundamental physical constants like c , h and m_e , it is acceptable to use them. No constants that are commonly defined in terms of such fundamental constants (for example, the Rydberg constant or the Bohr radius) are acceptable. It is your responsibility to make sure that no unacceptable information is available on your calculator.

A sheet that includes a list of physical constants, a periodic table without electron configurations, and most equations will be supplied for exam. Please note that values used for physical constants must be shown in your answers. Partial credit for a problem will be given only if each step of its solution is clearly shown. **Please pay attention to significant figures and units and box your final answer.** Equations for which you are responsible include $E = h\nu = hc/\lambda$, $c = \nu\lambda$, $KE = (1/2)mv^2$, and $p = mv$. In addition, you need to know principles such as how to determine the number of radial and angular nodes in a wavefunction, electron configurations, conservation of energy as applied to the photoelectric effect and photoelectron spectroscopy, the relationship between the four quantum numbers, and the physical significance of RPD. You should be able to sketch the RPD's for all orbitals up through $n = 4$. These are examples of principles that you should know, but this is NOT an all-inclusive list.