CHE 141 Lecture 15 Problem Set

Start reading Chapter 12.

Use the opening sections 12.1-12.2 to answer this question.

1. A blueray disc player uses a blue laser with a wave length of 405 nm. Calculate the frequency of the light and the energy in kJ/mole.

Use section 12.4 to answer this question.

2. The equation below gives the energy of an electron in orbit n of and atom with atomic number Z. The ΔE for an electronic transition between two orbits can be calculated by finding the difference between final and initial energies. Use these equations to calculate the ionization energy of a hydrogen atom in kJ/mol. The initial orbit will have n=1. When the electron escapes n = ∞.

\[
E = -2.178 \times 10^{-18} \frac{Z^2}{n^2}
\]

n (quantum number)
= 1, 2, 3, 4, 5, .... ∞

\[
\Delta E = E_{\text{final}} - E_{\text{initial}}
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