

CHEM105 Chapter Quiz 1

Name on Back Only Please

Please show all equations and all work to receive any credit

- Convert each of the following measurements into designated units:
 - 1.05 m^2 to μm^2
 - 3.4 dL to cm^3
 - 5.4 years to milliseconds
 - 0.78 pg to grams
- Calculate the change in potential energy, in Joules, that occurs when a 100 kg instructor walks up the stairs from the 1st to the 3rd floor of Sims; assume that each of the floors are 4.5 meters in height apart.
- Winthrop chemistry professor Robin Lammi uses a multi-mode Argon-Krypton gas laser to conduct single-molecule fluorescence experiments on amyloid- β peptide molecules that are known to cause Alzheimer's Disease. This summer, the National Science Foundation awarded Dr. Lammi's research project with a $\$251,000$ grant for the next four years to provide academic year and summer undergraduate research opportunities as well as travel expenses for students to present at national scientific conferences. At a presentation made 10 days ago by her students at the national American Chemical Society meeting in Washington DC, two Winthrop chemistry seniors reported using the 488 nm line for the laser to conduct the amyloid association experiments they were presenting results on to the nation's scientific community. For the 488 nm wavelength used:
 - Calculate the frequency of light.
 - Determine the energy of one photon at this wavelength emitted from the laser.
 - Determine the energy of one mole of photons of this electromagnetic radiation.
 - Identify what part of the spectrum (e.g. radio wave, X-ray) that this wavelength of electromagnetic radiation falls within.