Chem 302 Laboratory 1

Plotting and working with the Planck Distribution

NAME:

The Planck distribution predicts the intensities of all frequencies of radiation emitted by a black body. Its equation in terms of ***wavelengths*** l (m) is:



1. What are the values of the constants you need to plot the Planck distribution in MKS units?

2. Write an R function to plot the version of the Planck distribution shown above. You may use the che302r library to help. Load the function you wrote and use it to plot a black body distribution. Use a temperature of 1500K and try wavelengths in the range from 10 nm to 10,000 nm.

a. Upload your plot.

b. Paste in all your R code

3. What ***wavenumbers*** (in units of cm-1) do the wave number range you chose correspond to?

4. Approximately (i.e. use your eyes) where does the maximum intensity occur at this temperature. Express the maximum in units of cm-1, s-1 (Hz), *J*, and nm?

5. What named portion of the electromagnetic spectrum does the maximum fall in?

6. What spectroscopy might this black body radiator provide a good source of radiation for?