

### Homework #4 Due 9/27/23

- 1) A flame burns on the end of a steel tube, which causes some of the iron in the tube to vaporize and be entrained into the flame. At a location in which the flame temperature is 2500 K, the pressure is 0.1 atm, and 10 ppm of Fe atoms are present. The flame width is 1 cm. Plot the absorption spectrum across the flame at this location (considering only the iron as absorbing) from 374.55 nm to 374.60 nm (air wavelengths). Neglect collisional broadening. Use the “small absorption” approximation. Your plot should be scaled such that lineshapes and relative peak depths are clearly resolved.
- 2) An absorption measurement is made of atomic lanthanum. Instrument broadening far exceeds the doppler and collision linewidths. Find the temperature of the gas, assuming small absorption limit. Plot data are on the website.

