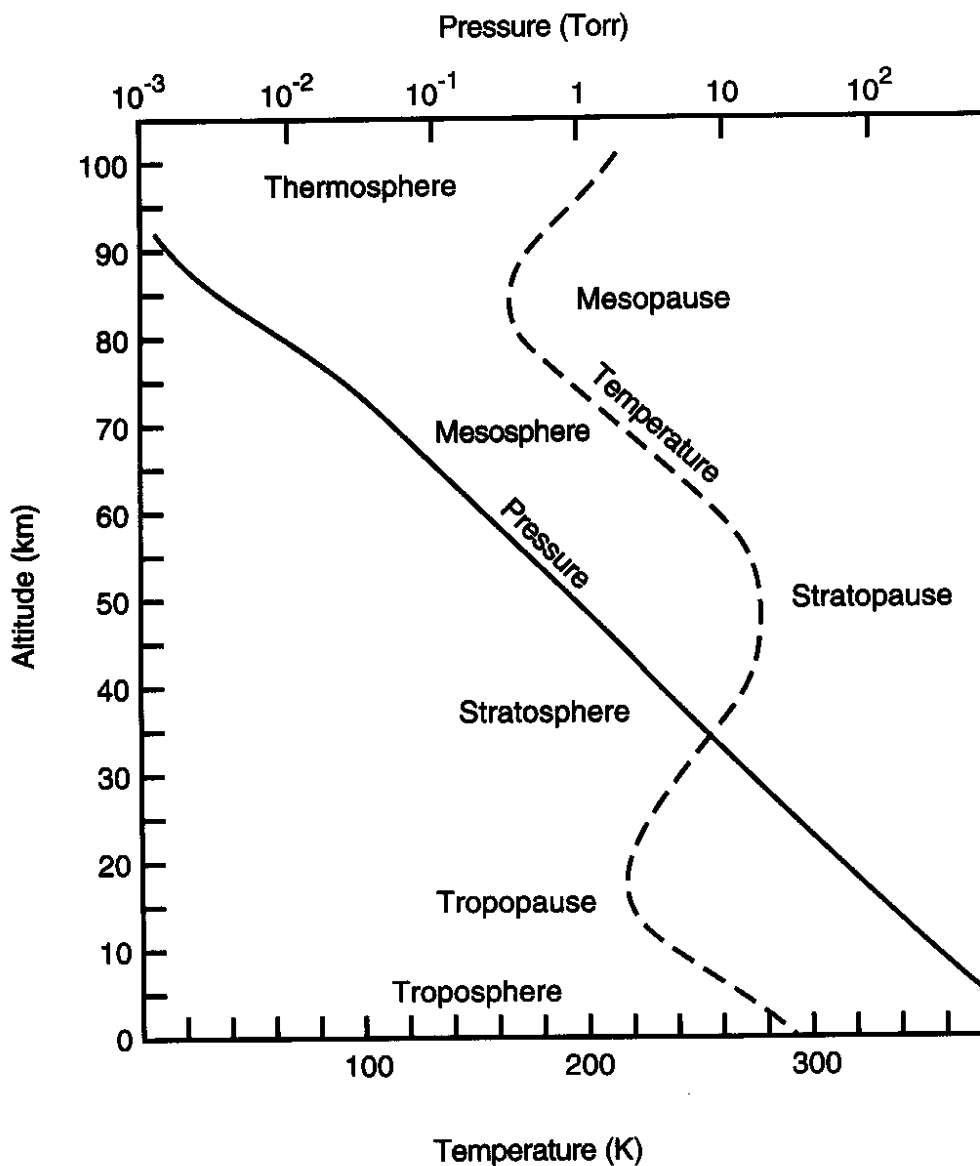


**Analytical Chemistry**  
**Problem Set 1—due Monday, January 31, 2005**

Feel free to check your final numerical answers to text problems (found in the “AN” section in the back of your text), but realize that your answers must be justified to receive any credit.

Total possible points for this assignment = 40. Remember, however, that each problem set will be equally weighed in determining your overall homework score.

1. (6 points) Harris 1-20
2. (6 points) Harris 1-32. Note that “FM” stands for formula mass. Harris will often spare you the trouble of calculating formula masses, particularly for compounds with intricate chemical formulas.
3. (6 points) At an altitude of 32 km, the pressure is 10 Torr and the mixing ratio of O<sub>3</sub> is 7 ppm. Using the data provided in the figure on the back of this page, calculate the number density of ozone at this altitude. (Note: You should determine the temperature at 32 km to the nearest 10 K.)
4. (16 points) Harris 27-19
5. (6 points) Harris 27-23. Chemists are gruesome folks, aren't they? Remember that for solution-phase samples (unlike gas-phase samples), a concentration of, say, parts per thousand refers to a ratio of *masses*. Also note that Harris assumes that we know the mass of the man to two significant figures (the “0” in 70 kg is significant).



**FIGURE 1.1** Typical variation of temperature with altitude at mid-latitudes as a basis for the divisions of the atmosphere into various regions. Also shown is the variation of total pressure (in Torr) with altitude (top scale, base 10 logarithms) where 1 standard atmosphere = 760 Torr.

from Finlayson-Pitts, B. J.; Pitts, J. N., Jr. *Chemistry of the Upper and Lower Troposphere*; Academic Press: San Diego, 2000; Chapter 1.