Phy 410
Quiz #7, March 19, 2010

The average number of particles of an ideal gas (mass m) at temperature τ and pressure p adsorbed on a surface is given by

$$f = \frac{< N >}{N_S} = \frac{p}{p + p_0};\ p_0 = \tau n_Q e^{-E/\tau},$$

where E and n_Q are the binding energy of the atoms to the surface and quantum concentration respectively.

A) Sketch f vs p. Does the slope near $p = 0$ increase or decrease with p_0?

B) Two types of gases (1 and 2) are exposed to the same surface and have exactly the same E. At a given τ, f for 1 rises faster than that for 2 near $p = 0$. Which atoms are lighter, 1 or 2?