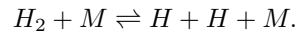


AME 60636

Homework 2

Due: Friday, 30 January 2009, in class

Consider a problem of hydrogen dissociation and recombination:



1. Consider the appropriate parameters for the reaction as found in the 2005 *AIAA Journal* paper found in the documents section of the course home page. Take $T = 6000\text{ K}$. Find thermodynamic properties from any standard thermodynamics textbook. Write a code in Fortran and Mathematica to calculate the concentrations as a function of time if initial concentrations are $\hat{p}_{H_2} = 0.001\text{ mol/cm}^3$, $\hat{p}_H = 0.001\text{ mol/cm}^3$. Give plots of concentration versus time and pressure versus time.
2. For the same initial conditions, generate a plot of how the equilibrium concentrations of H and H_2 vary with temperature.
3. Give a plot of how the time scales found by linearization behave as temperature is varied over a wide range.
4. Using an appropriate text or the AME 60636 course notes for guidance, give a derivation linking K_p to K_c .