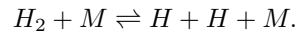


AME 60636

Homework 2

Due: Friday, 3 February 2012, 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 $\widehat{p}_{H_2} = 10^{-6} \text{ mol/cm}^3$, $\widehat{p}_H = 10^{-6} \text{ mol/cm}^3$. 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 near equilibrium behave as temperature is varied over a wide range.