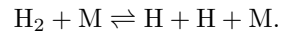


AME 60636

Homework 2

Due: Wednesday, 26 January 2022, 12:05 PM, on Sakai

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 $T = 6000$ 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 $\widehat{p}_{\text{H}_2} = 10^{-6}$ mol/cm³, $\widehat{p}_{\text{H}} = 10^{-6}$ mol/cm³. 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 H₂ 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.