TUTORIAL-9 (23 Apr 2019) Thermodynamics for Aerospace Engineers (AS1300)

1. Find the heat of formation of CO2 gas at 500K, without using the direct table entry at that temperature. Check your result with the data in the table.

2. Calculate the Tad for the following H2+air mixtures at 298.15 K, 1bar. (i) ϕ = 1.0, (i) ϕ =0.9,(i) ϕ =1.5.

3. H2 at 400K and air at 500K are entering a reactor in the ratio of H2:air= 1:46 by weight. If there was a heat loss from the reactor of 100 kJ/kg of H2, find the final temperature of the products.

Problems to be solved in class

1. Find the Adiabatic flame temperature for H2+O2 stoichiometric mixture at 300K and 1bar. What will be the T_{ad} if the initial temperature was 350K?

2. Find the Tad, if the reactants are: CH4 at 298.15 K, 1bar and air at 700 K at equivalence ratio of 2. Assume no dissociation of products.