HOMEWORK SET 16: MAXWELL SPEED DISTRIBUTIONS
Due Monday, March 18, 2022

PROBLEMS FROM OR AFTER THORNTON & REX (TREX 3RD ED.)

9.7) As written in TRex

9.9) As written in TRex

9.12 Altered) Consider the ideal gas H_2 at T = 293K.

a) Find v_{mp} in m/s

READ EXAMPLE 9.4 CAREFULLY AND USE THE APPROXIMATION GIVEN TO DETERMINE THE FRACTION OF MOLECULES IN THE RANGES OF

b) 0.95 v_{mp} and 1.05 v_{mp}

c) 0.5 v_{mp} and 0.6 v_{mp}

d) 1.5 v_{mp} and 1.6 v_{mp}

Comment on the fractions of molecules in each range in view of the plot.

9.13 Altered) We found the r.m.s velocities of H_2 and N_2 gases at 14°C = 287K and compared them to Earth's escape velocity. Do this now for O_2 and CO_2 (show how the escape velocity is derived and calculate it for yourself).

Maxwell–Boltzmann Speed Distribution for H at STP