Q1 - Answer = c

Q2 - Problem A - Last name A-K

What is the total kinetic energy in one mole of hydrogen gas at 20 °C? (N_A = 6.02 x 10^{23} mol^{-1}, k=1.38 x10^{-23} J/K)

A. 8.3 J

B. 166 J

C. 250 J

D. 2430 J

E. **3650 J**

$KE = N_A \times 1/2\ mv^2 = N_A x 3/2\ kT$

$= 6.02x10^{23}x3/2 \times 1.38 \times 10^{-23}x293$

$= 3650$ J

Q1 - Answer = c
Q2 - Problem B - Last Name L-Z

- What is the average speed of a molecule of N_2 (mass = 4.6×10^{-26} kg) in a container held at a temperature of 300 °C? ($k = 1.38 \times 10^{-23}$ J/K)

A. 415 m/s

B. **718 m/s**

C. 519 m/s

D. 300 m/s

E. 293 m/s

$1/2\ mv^2 = 3/2kT$

$v = (3\ k\ T/m)^{1/2}$

$= (3x1.38x10^{-23}x573/4.6x10^{-26})^{1/2}$

$=718$ m/s