Thursday key

Useful Information: $N_A = 6.022140857 \times 10^{23}$/mol, $R = 8.314$ J/(mol K) = 0.08206 L atm/(mol K), 1 J = 1 kg m^2/s^2, 1 L = (0.1 m)^3, 1 atm = 1.01325 bar, 1 bar = 10^5 Pa, 1 Pa = 1 kg/(m s^2), $u_{rms} = \sqrt{3RT/M} = u_{\mathrm{mp}}\sqrt{3/2}$,
$[P + a(n/V)^2](V - nb) = nRT$

1. (4 points) The chemical reaction 2 A(g) + 3 B(g) ⇌ C(g) is carried out in a rigid 2.00 L container at 28.7 ºC. At the start of the reaction, 3.00 atm of A and 6.00 atm of B are added to the container, for a total pressure of 9.00 atm. What will be the total pressure in the container at the end of the reaction?

   A is a L.R. 2points

	2 A(g) +	3 B(g)	⇌	C(g)
Initial:	3.00atm	6.00 atm		
Used:	-3.00	-4.50		+1.50
End:	0atm	1.50atm		1.50atm

$$P= n^*\frac{RT}{V};\ P\sim n$$

   P_{tottal}=3.00atm 2points

2. (3 points) At a certain temperature, T_1, and pressure, P_1, a 1.0 mole sample of gaseous acetaldehyde has a root mean square velocity of $u_{rms,1}$ inside a closed container. The pressure inside of the container is increased by a factor of four, $P_2 = 4\ P_1$, at constant temperature. Circle the correct relationship between the initial rms velocity, $u_{rms,1}$, and the final rms velocity, $u_{rms,2}$.

   $\boldsymbol{u_{rms,1} = u_{rms,2}}$

3. (3 points) At a certain temperature, T_1, and pressure, P_1, a 2.0 mole sample of gaseous acetaldehyde has a root mean square velocity of $u_{rms,1}$ inside a closed container. The temperature inside of the container is increased by a factor of four, $T_2 = 4\ T_1$. Circle the correct relationship between the initial rms velocity, , $u_{rms,1}$, and the final rms velocity, $u_{rms,2}$.

   $\boldsymbol{u_{rms,1} = 1/2\ u_{rms,2}}$

Friday key

Useful Information: N_A = 6.022140857 × 10^{23}/mol, R = 8.314 J/(mol K) = 0.08206 L atm/(mol K), 1 J = 1 kg m^2/s^2, 1 L = $(0.1\ m)^3$, 1 atm = 1.01325 bar, 1 bar = 10^5 Pa, 1 Pa = 1 kg/(m s^2), $u_{rms} = \sqrt{3RT/M} = u_{mp}\sqrt{3/2}$,
$[P + a(n/V)^2](V - nb) = nRT$

1. (4 points) The chemical reaction 2 A(g) + 3 B(g) ⇌ C(g) is carried out in a rigid 2.00 L container at 28.7 °C. At the start of the reaction, 5.00 atm of A and 6.00 atm of B are added to the container, for a total pressure of 11.00 atm. What will be the total pressure in the container at the end of the reaction?

B is a L.R. 2points

$P = n^* \frac{RT}{V}$; P~n

	2 A(g) +	3 B(g) ⇌	C(g)
Initial:	5.00atm	6.00 atm	
Used:	-4.00	-6	+2.00
End:	1atm	0. atm	2.00atm

P_{tottal}=3.00atm 2points

2. (3 points) At a certain temperature, T_1, and pressure, P_1, a 1.0 mole of gaseous acetaldehyde has a root mean square velocity of $u_{rms,1}$ inside a closed container. The pressure inside of the container is decreased by a factor of four, $P_1 = 4\ P_2$, at constant temperature. Circle the correct relationship between the initial root mean square velocity, $u_{rms,1}$, and the final root mean square velocity, $u_{rms,2}$.

$\underline{\boldsymbol{u_{rms,1} = u_{rms,2}}}$

3. (3 points) At a certain temperature, T_1, and pressure, P_1, a 2.0 mole of gaseous acetaldehyde has a root mean square velocity of $u_{rms,1}$ inside a closed container. The temperature inside of the container is decreased by a factor of four, $T_1 = 4\ T_2$. Circle the correct relationship between the initial root mean square velocity, $u_{rms,1}$, and the final root mean square velocity, $u_{rms,2}$.

$\underline{\boldsymbol{u_{rms,1} = 2\ u_{rms,2}}}$