* same T *

$E_{K_1} = E_{K_2}$

$\frac{1}{2}mv_1^2 = \frac{1}{2}mv_2^2$

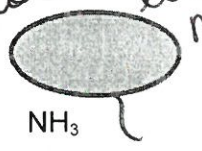
Review

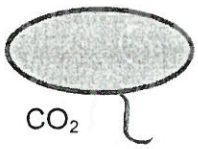
Little Guys and Molar Volume

* same V, T + P ∴ same #n ! *

1. You have a 1.00 L of $NH_3(g)$ and 1.00 L flask of $CO_2(g)$ both 75.0 kPa and 22.0 °C.

17g/mol low mm " skinny fast





44g/mol hi mm slow

(i) same T = same ave EK

(ii) ∴ lower mm = faster velocity

Compare the two flasks using terms such as >, <, or =.

a)	Average Velocity	$V_1 > V_2$	>
b)	Average Kinetic Energy	$E_{K_1} = E_{K_2}$	=
c)	Number of Molecules	$n_1 = n_2$	=
d)	Total Mass	$PV=nRT$! ∴ $m_1 < m_2$	<

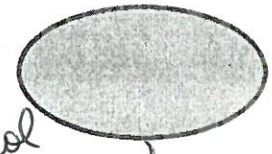
2. You have a 10.0 L flask at 15.0 °C and 96.0 kPa filled with $H_2(g)$ and a second 5.0 L flask at 15.0 °C and 192 kPa filled with $O_2(g)$

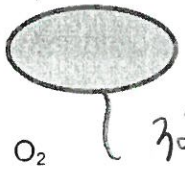
same T! same ave EK

slow speed

$H_2 = \frac{PV}{RT} = \frac{nRT}{RT} = \frac{(96)(10)}{(8.314)(288)} = 0.4\ mol$

2g/1mol





$O_2 = \frac{(192)(5)}{(8.314)(288)} = 0.4\ mol$

32g / 1mol

low mm = fast speed

hi mm

Compare the two flasks using terms such as >, <, or =.

PV=nRT it!

e)	Average Velocity	$V_1 > V_2$	>
f)	Average Kinetic Energy	$E_{K_1} = E_{K_2}$	=
g)	Number of Molecules	$n_1 = n_2$	=
h)	Total Mass	$m_1 < m_2$	<

3. Zinc sulfide reacts with oxygen to produce zinc oxide and sulfur dioxide.

BCE: $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$

Identify the reactant particles: $ZnS + O_2$

– standard T & P 273 K & 101.3 kPa

If 50.0 g of oxygen gas at STP reacts with zinc sulfide then the:

i) moles of sulfur dioxide produced would be 1.04 mol

ii) mass of sulfur dioxide produced would be 66.6 g

iii) number of molecules of sulfur dioxide would be 6.26×10^{23} molec

iv) volume of sulfur dioxide at STP would be 23.3 L

v) volume of sulfur dioxide at 65.2 kPa and 27.0 °C would be 38.6 L

4. Copper (2) oxide reacts with ammonia to produce water vapour, nitrogen and copper.

BCE: $3CuO + 2NH_3 \rightarrow 3H_2O + N_2 + 3Cu$

Calculate the volume of nitrogen at STP that can be produced from 100.00 g of copper (2) oxide. 9.39 L N_2

5. Calculate the volume of hydrogen chloride at SATP that is needed to produce $1.25\ 10^2$ g of chlorine. 0.79 L