Latihan Soal

Qornain Aji
21/488767/TK/53176

1) $CO_2 = 2 \times 10^6$ l

C = 12 O = 16

Jumlah partikel

Berat $CO_2 = (12 + 32)\ 1.66 \cdot 10^{-27}$
$= 7,304 \times 10^{-26}$ kg

Jumlah partikel $= \frac{1 \cdot 10^{26}}{7,304}$

$= 1,36911 \times 10^{25}$ //

Kerapatan molekul $= \frac{N}{V}$

$= \frac{1,36911 \times 10^{25}}{2 \times 10^6}$

$= 6,84555 \times 10^{18}$ //

2) Bejana aluminium Volume = 150 cm^3
$= 15 \cdot 10^{-5}$

T = 27°C

Dipanaskan → T = 100°C

β aluminium $= 2,3 \times 10^{-5}$

β air $= 4,4 \times 10^{-5}$

air tumpah = ?

ΔV Bejana I $= \beta \cdot V_0 \cdot 27°$
$= 2,3 \times 10^{-5} \cdot 15 \cdot 10^{-5} \cdot 27$
$= 931,5 \times 10^{-10}$

ΔV Bejana II $= \beta \cdot V_0 \cdot 73$
$= 2,3 \times 10^{-5} \cdot 15 \cdot 10^{-5} \cdot 73$
$= 2518,5 \times 10^{-10}$

$V = \Delta V$ Bejana I $+ \Delta V$ Bejana II $+ V_0$
$\approx 15,0345 \times 10^{-5}$

$\Delta V_{air} = \beta \cdot V_0 \cdot 73 =$
$= 4,818 \times 10^{-6}$

$V_{air} = \Delta V + V_{0\,air}$
$= 15 \times 10^{-5} + 4,818 \times 10^{-6}$
$= 154,818 \times 10^{-6}$
$= 15,4818 \times 10^{-5}$

V air yg tumpah $= (15,4818 - 15,0345) \times 10^{-5}$
$= 4473 \times 10^{-5}$ m^3 //

3) Kita tahu bahwa $\frac{PV}{T}$ = konstan

Sehingga $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$

$\frac{PV}{T} = \frac{3/2 P \cdot V_2}{\frac{5}{3} T}$

$V = \frac{9}{10} V_2 \rightarrow V_2 = \frac{10}{9} V$ //

4) gas - $P = 2$ atm

$T = 200^\circ C$

1) ekspansi isotermal $\rightarrow V_2 = 2V_1$

2) kompresi isobarik $\rightarrow$ kembali volume awal

1) $P = \frac{nRT}{V} = \frac{\text{konstan}}{V}$

$P_1 V_1 = P_2 V_2$

$P_1 V_1 = P_2 2V_1$

$2 \text{ atm} = 2P_2$

$P_2 = 1 \text{ atm}$

2) kompresi isobarik

$P_2 = P_3$

$\frac{nRT_2}{V_2} = \frac{nRT_3}{V_1}$

$\frac{T_2}{\frac{1}{2}V_1} = \frac{T_3}{V_1}$

$T_2 = 2T_3$

$273 + 200^\circ C = 2T_3$

$473 = 2T_3$

$946 = T_3$

$P_{akhir} = 1 \text{ atm}$

$T_{terakhir} = 946 - 273 = 673^\circ C$ //