gases

(1)

$V_1 = 400\ cm^3$ | $V_2 = 50{,}0\ cm^3$

$P_1 = 1\ atm$ | $P_2 = ?$

$t = 15°C$ | $t_1 = 77°C$

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

$$\frac{400 \times 1}{15} = \frac{50 \times P_2}{77}$$

$$P_2 = 41{,}06$$

$$P_2 \approx 41{,}10\ atm$$

$$\frac{P_1 V_1}{T_2} =$$

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(2) $1{,}2 \times 10^7\ L$ He.

$P = 737\ mm\ Hg$

$T = 25$

$m_{He} = ?$

$$PV = mRT$$

$$PV = \frac{m}{M} RT.$$

$$\frac{PVM}{RT} = m$$

$P = 0{,}9697\ atm$

$t = 273 + 25 = 298.$

$V = 1{,}2 \times 10^7\ L$

$R = 0{,}082$

$M_{He} = 4\ g/mol$

$$\frac{0{,}9697 \times 1{,}2 \times 10^7 \times 4}{0{,}082 \times 298} = 1{,}9 \times 10^8\ g$$

(3) $B_x H_y$

$m_{gás} = 12,5 mg$

$T = 25°C$

$P_{atm} = 24,8 mmHg$

$V = 12,5 ml$

$PV = nRT$

$PV = \frac{m}{M} RT$

$M = \frac{mRT}{PV}$

$M = \frac{12,5 \times 10^{-3} \times 0,082 \times 298}{0,033 \times 0,127}$

$M = 74,0 g/mol \approx B_6H_{10}$.

$74,866 g/mol$

$74,7 g/mol$

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(4) $2NaN_3(s) \longrightarrow 2Na(s) + 3N_2(g)$

$V = 75L$

$P = 1,3 atm$

$T = 298 K$

$PV = nRT$

$n_{N_2} = \frac{PV}{RT} = \frac{1,3 \times 75}{0,082 \times 298} \approx 4,00$

$1 mol\ NaN_3 \rightarrow 65$

$2,67\ NaN_3 - x$

$2 - 3$

$x - 4$

$x = \frac{8}{3} = 2,67 moles\ NaN_3$

$n = 173,55 g$

$173,6 g$

gas x. = $M(x) = ?$ (6)

$$v_x = \frac{1}{3} v_{He}$$

$$E_c = \frac{1}{2} m v^2.$$

$$v_1 = \sqrt{\frac{1}{M_1}}$$

$$\frac{v_x}{v_{He}} = \sqrt{\frac{M_{He}}{M_x}}$$

$$\frac{v_{He}}{3 v_{He}} = \sqrt{\frac{4}{M_x}}$$

$$\left(\frac{1}{3}\right)^2 = \frac{4}{M_x}$$

$M_x = 9 \times 4$

$M_x = 36$ g/mol

(5)

$C_2HBr_2ClF_3 + O_2$

a) moles

b) 160g Halotano

$m_{O_2} = ?$

$P(\text{halotano}) = 170 \text{ mm Hg}$

$P(O_2) = 570 \text{ mm Hg}$

$P_{(Halotano)} = x_{Halotano} \times P_T \Leftrightarrow \frac{170}{740} = x_{Halotano} = 0,229$

$P_{O_2} = x_{O_2} \times P_T \Leftrightarrow \frac{570}{740} = x_{O_2} = 0,770$

$= 0$

$P_T = 170 + 570 = 740 \text{ mm Hg}$

b) $1 \text{ mol } O_2 \rightarrow 32 \text{ g}$

$x \rightarrow 160 \text{ g}$

$x = 5 \text{ moles}$

$x_H = \frac{n_H}{n_{O_2} + n_H}$

$0,229 = \frac{n_H}{5 + n_H}$

$1,145 + 0,229 n_H = n_H$

$n_H = 1,49 \text{ moles}$

$1 \text{ mol } C_2HBr_2ClF_3 \rightarrow 197,38 \text{ g}$

$1,49 \rightarrow x$

$x = 293,5 \text{ g}.$

$S_n F_y$

(7)

25,23% de S

0,0955 g

$P_{gaz} = 83,8 \text{ mm Hg}$

0,11 atm

Famille moléculaire

$S_n F_y$.

$m = 0,0955$ g

$V = 89$ mL

$T = 45°C$

$PV = nRT = \frac{PV}{RT} = \frac{m}{M}$

~~$0,11 \times V$~~

$M = \frac{mRT}{PV}$

$M = \frac{0,0955 \times 0,082 \times (273+45)}{0,11 \times 8,9 \times 10^{-2}}$

$M = 254,3675$

$M = 254,37$ g/mL

$254,37 \times 0,2523 = \frac{64,18}{32} \simeq 2$

$254,37 \times (1 - 0,2523) = \frac{190,19}{19} \simeq 10$

$S_2 F_{10}$

~~E.6~~ 9

$P = ?$

$V = 5L$

$325\ g\ H_2O$

$T = 275°C$

$PV = nRT$) VAN DER WAALS.

$\left(P + a\left(\frac{n}{V}\right)^2\right)(V - bn) = nRT$

a ; b

↓ ↳ 0,0305.

5,46

~~P=~~ $P = \dfrac{nRT}{V - bn} - a\left(\frac{n}{V}\right)^2$

$\underbrace{\quad\quad}_{547}$

~~P=~~ $P = \dfrac{\frac{325}{18} \times 0,082 \times (275+273)}{5 - 0,0305 \times \frac{325}{18}} - 5,46\left(\frac{325}{18 \times 5}\right)^2$

a) $P = 111\ atm$

~~b)~~ $PV = nRT$

$P = \dfrac{\frac{325}{18} \times 0,082 \times 574}{5} = 162$

$bn = 0,0305 \times \frac{325}{18} = 0,11$

$a\left(\frac{n}{V}\right)^2 = 5,46 \times \left(\frac{325}{18 \times 5}\right)^2 = 19,~~70~~$ · Más importante.

(4) ClO_2

(9) Cl, O, F

0,150 g

17,2 mmHg

V = 1850 ml

T = 21°C

$PV = \frac{m}{M}RT$ $M = \frac{mRT}{PV}$

$M = \frac{0,150 \times 0,082 \times 294}{\frac{17,2}{760} \times 1,850}$

M = 86,37 g/mol ≈ 86,9 g/mol

$Cl_xO_yF_z$

35,5 16 19 = 67

2x Cl O F

106 88,5 87,5

$ClOF_2$

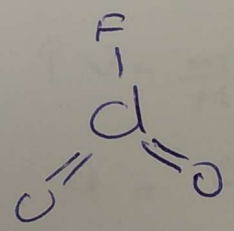
ClO_2F

possible mais très rare. Plus stable

Cl au centre

F à gauche

Base trois hexa



$4NH_3(g) + 3F_2(g) \rightleftharpoons 3NH_4F(s) + NF_3(g)$ (10)

$P(NH_3 + F_2) = 120\ mmHg$

$P_{NH_3} = ? \Rightarrow P_T \cdot \chi_{NH_3} = \frac{4}{7} \times 120 = 69{,}0\ atm$

$P_{F_2} = ? = P_T \cdot \chi_{F_2} = \frac{3}{7} \times 120 = 51{,}4\ atm$

No final só temos NF_3 como gás.

b) $\frac{68{,}57}{4} = P_{T(no\ final)} = 17{,}25 \approx 17{,}3\ atm$