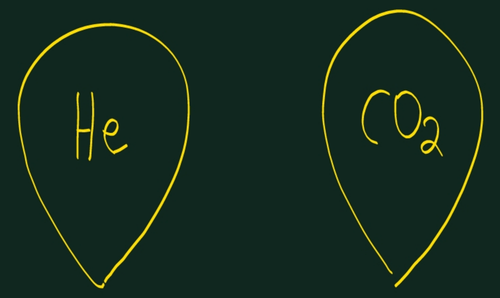
Αρχή του Avogadro

"Ίσοι" όγκοι αερίων (ή ατμών) στις ίδιες συνθήκες P, T περιέχουν τον ίδιο πλήθος μορίων



$$V_1 = V_2 \Leftrightarrow N_1 = N_2$$

$$\Leftrightarrow \frac{N_1}{N_A} = \frac{N_2}{N_A}$$

$$\Leftrightarrow n_1 = n_2$$

1mol οποιουδήποτε αερίου καταλαμβάνει συγκεκριμένο όγκο, Vm

STP: πρότυπες συνθήκες πίεσης και θερμοκρασίας

$$\left.\begin{array}{l} P = 1atm \\ T = 273K \Rightarrow \theta = 0^\circ C \end{array}\right\} STP$$

$$V_m = 22,4L$$

N: πλήθος μορίων NH_3 (αμμωνία)

$V = 1{,}12\,L$ (STP)

$$n = \frac{V}{V_m} = \frac{N}{N_A} \Rightarrow$$

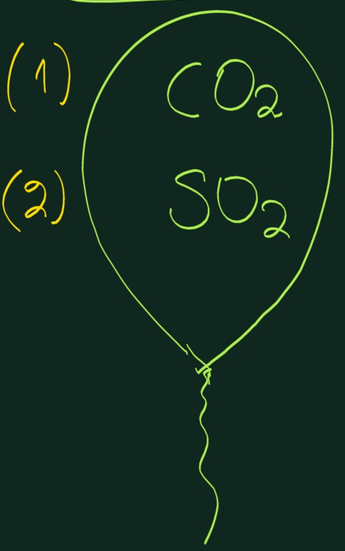
$$\frac{1{,}12}{22{,}4} = \frac{N}{N_A} \Rightarrow$$

$$\frac{N}{N_A} = 0{,}05 \Rightarrow$$

$$N = 0{,}05 \cdot N_A$$

Παρ. 4.7

$Ar(C)=12 \quad Ar(O)=16 \quad Ar(S)=32$



x mol $\quad M_{r(1)} = 12+16\cdot 2 = 44 \quad m_1 = x\cdot M_{r(1)} \quad V_1 = x\cdot 22{,}4$

y mol $\quad M_{r(2)} = 32+16\cdot 2 = 64 \quad m_2 = y\, M_{r(2)} \quad V_2 = y\cdot 22{,}4$

$m = m_1+m_2 = 7{,}6g \Rightarrow x\cdot 44 + y\cdot 64 = 7{,}6$ (A)

$V = V_1+V_2 = 3{,}36L \Rightarrow x\cdot 22{,}4 + y\cdot 22{,}4 = 3{,}36$ (B)

$m = 7{,}6g$

$V_{STP} = 3{,}36L$

(B) $22{,}4(x+y) = 3{,}36 \Rightarrow x+y = \frac{3{,}36}{22{,}4} = 0{,}15$ mol

(A) $11x + 16y = 1{,}9$

$-16x - 16y = -16\cdot 0{,}15$

$-5x =$

κλπ.

16 | m=;

O_2: n=10mol

$M_r(O_2) = 16 \cdot 2 = 32$

$n = \frac{m}{M_r} \Rightarrow m = n \cdot M_r$

$= 10 \cdot 32$

a) $= 320g$

16b | m=;

2mol CO_2

$M_r(CO_2) = 16 \cdot 2 + 12 = 44$

$n = \frac{m}{M_r} \Rightarrow m = n \cdot M_r$

$= 2 \cdot 44 \Rightarrow$

$m = 88g$

17a. n=;

m = 560g N_2

$M_r(N_2) = 2 \cdot 14 = 28$

$n = \frac{m}{M_r} = \frac{560}{28} = 20mol$

18a $V = ;$

$n = 3\,mol\ NH_3$

(STP)

$n = \frac{V}{V_m} \Rightarrow V = n \cdot V_m$

$= 3 \cdot 22{,}4 \Rightarrow$

$V = 67{,}2\,L$

19 a. $N = 10 N_A$ NH_3

$n = ;$

$n = \frac{N}{N_A} = \frac{10 \cancel{N_A}}{\cancel{N_A}} = 10\,mol.$

3. $112\,L\ H_2S$ $n = \frac{V}{V_m} = \frac{112}{22{,}4} = 5\,mol$

$; mol$