

Қатысушының шешімдерін толтыруға арналған өріс / Поле для заполнения решений участника Парақ / Страница №

1.  $pH = 2,8$

$pH = -\log [H^+]$

~~$H = 10^{-pH}$~~

$[H^+] = 10^{-pH} = 10^{-2,8}$

$[H^+] \approx 1,58 \cdot 10^{-3} M$

$K_{\omega} = [H^+][OH^-] = 1,0 \cdot 10^{-14}$

$[OH^-] = \frac{K_{\omega}}{[H^+]} = \frac{1,0 \cdot 10^{-14}}{1,58 \cdot 10^{-3}}$

$[OH^-] \approx 6,3 \cdot 10^{-12} M$

2.  $50^\circ - 2$  мин  $40$  сек  $- + 50^\circ$

$80^\circ - ?$

$\alpha_{\text{жылыну}} = 2$

$(130 \cdot 2 = 260)$

$(260 - 160 = 100 \text{ c} = 1 \text{ мин } 40 \text{ сек})$

$\frac{\Delta T_1}{\Delta T_2} = \gamma \frac{T_1 - T_0}{T_2 - T_0} = 2 \frac{80 - 50}{10} = 2 \cdot 3 = 6$

$100 \text{ c} = 1 \text{ мин } 40 \text{ сек}$

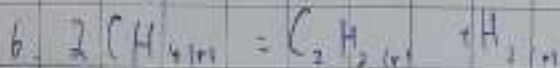
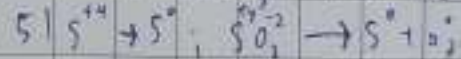
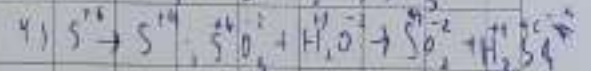
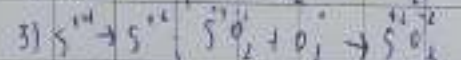
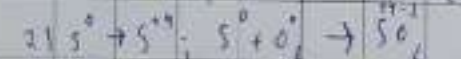
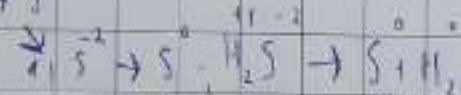
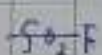
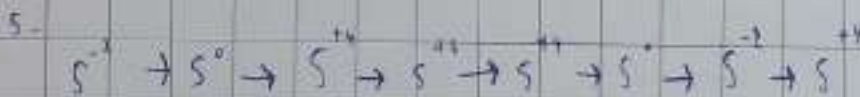
3.  $\rho_{\text{желез}} = 7,8 \text{ г/см}^3$

$\rho_{\text{алюмин}} = 2,7 \text{ г/см}^3$

$\rho_{\text{алмаз}} = 3,5 \text{ г/см}^3$

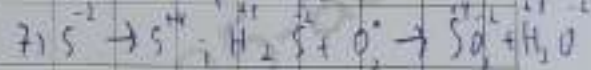
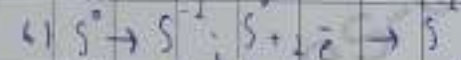
Содержание  $- 25\% \text{ H}_2$   $+ 75\% \text{ C}$

$\frac{0,25 \cdot 22,5}{0,400} = \frac{22,5}{1,600} = 10 \text{ м.л.}$



$293 \text{ K}$

Түрленген де салыстырылған  $1173 \text{ K}$





Қатысушының қолжазбасын талтырауға арналған нөмір / Поле для заполнения номерной участника: Парақ / Страница №

$$2. \frac{20^{\circ}\text{C}}{20^{\circ}\text{C}} = 2 \frac{T_2 - T_1}{T_1} = 2 \frac{80 - 50}{50} = 2 \frac{30}{50} = 2^3 = 8$$

$$160:8 = 20$$

$$1. \text{pH} = -\text{pOH}(\text{H}^+)$$

$$[\text{H}^+] = 10^{\text{pH}} = 10^{-2.8}$$

$$[\text{H}^+] \approx 1,58 \cdot 10^{-3} \text{ M}$$

$$K_w = [\text{H}^+][\text{OH}^-] = 1,0 \cdot 10^{-14}$$

$$[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{1 \cdot 10^{-14}}{1,58 \cdot 10^{-3}}$$

$$[\text{OH}^-] \approx 6,31 \cdot 10^{-12} \text{ M}$$

$$3. M = \frac{mRT}{pV} \quad R = 0,0821 \text{ - ұнм барометр газ}$$

$$T = 273 \text{ K}$$

$$M = \frac{(0,4 \cdot 0,0821 \cdot 273)}{0,5 \cdot 1,12} \text{ - формула}$$

$$C: \frac{45}{12} = 3,75;$$

$$H: \frac{25}{1} = 25$$

$$\frac{25}{3,75} : \frac{6,25}{6,25} = 4:1$$

$\text{C}_4\text{H}_4$  - метан

4. дайара

$M_{\text{дайара}} = 58$

$M_{\text{дайара}} = 29 \text{ г/моль}$

$M_{\text{дайара}} = \text{дайара} \cdot M_{\text{дайара}} = 2 \cdot 29 = 58 \text{ г/моль}$

$M_r(\text{C}_2\text{H}_2) = 12 \cdot 2 + 1 \cdot 2 = 26 \text{ г/моль}$

$(\text{C}_2\text{H}_2)$  - ацетилен

$M_r(\text{SO}_2) = 32 + 16 \cdot 2 = 64 \text{ г/моль}$

$(\text{SO}_2)$  - күкірт  
диоксиді

$M_{\text{дайара}} = n \cdot M_r(\text{C}_2\text{H}_2) + (1-n) \cdot M_r(\text{SO}_2)$

$$58 = n \cdot 26 + (1-n) \cdot 64$$

$$58 = 26n + 64 - 64n$$

$$58 - 64 = 26n - 64n$$

$$-6 = -38n$$

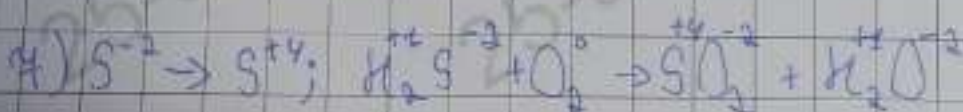
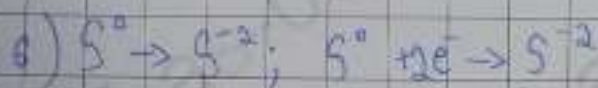
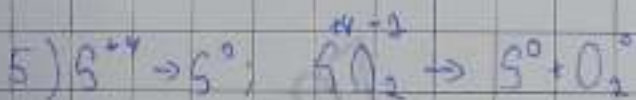
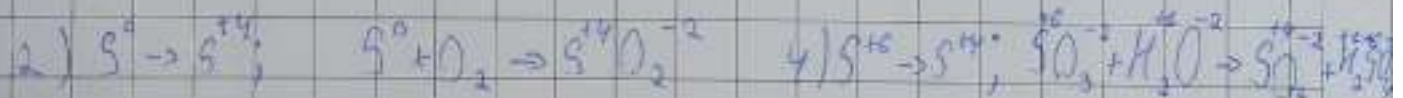
$$n = -6 / -38 = 0,158$$

$$1 - 0,158 = 0,842$$

$$0,158 \cdot 100 = 15,8\% (\text{C}_2\text{H}_2)$$

$$0,842 \cdot 100 = 84,2\% (\text{SO}_2)$$

5.  $\text{S}^{-2} \rightarrow \text{S}^0 \rightarrow \text{S}^{+4} \rightarrow \text{S}^{+6} \rightarrow \text{S}^{+4} \rightarrow \text{S}^0 \rightarrow \text{S}^{-2} \rightarrow \text{S}^{+4}$



Қатысушының шешимдерін талпыруға арналған өріс / Поле для заполнения решений участника: Парек / Страница №

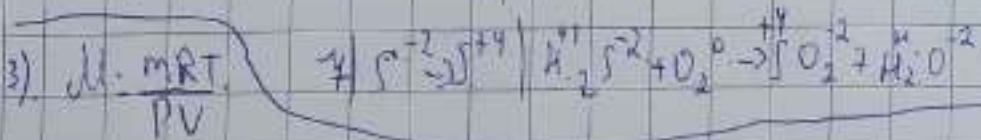
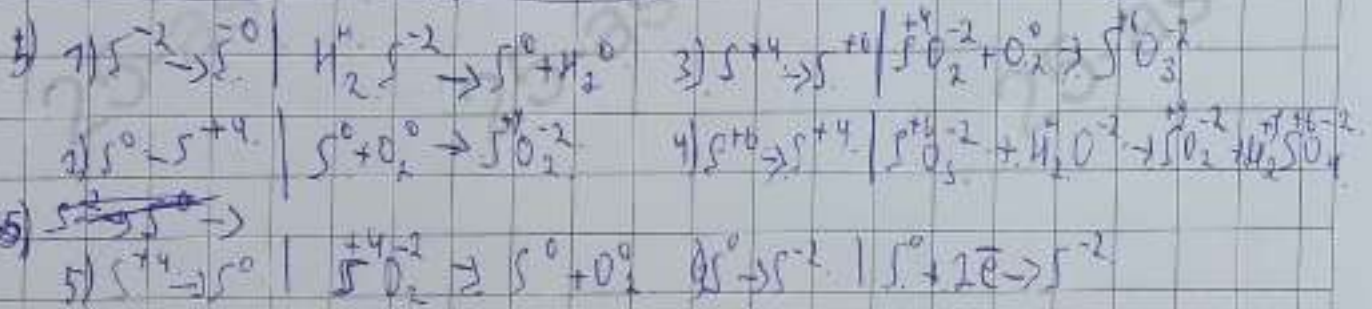
$$1) \text{pH} = -\log(\text{H}^+) \\ [\text{H}^+] = 10^{-\text{pH}} = 10^{-2,8}$$

$$[\text{H}^+] \approx 1,58 \times 10^{-3} \text{ M}$$

$$K_w = [\text{H}^+] [\text{OH}^-] = 1,0 \cdot 10^{-14}$$

$$[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{1 \cdot 10^{-14}}{1,58 \cdot 10^{-3}} = [\text{OH}^-] \approx 6,31 \cdot 10^{-12} \text{ M}$$

$$2) \frac{g}{g} = \gamma \frac{T_2 - T_1}{T_0} = 2 \frac{20 - 10}{10} = 2 \frac{10}{10} = 2^3 = 8 \\ \pm 100/8 = 12,5 \text{ сәк}$$



R, 0,0821 - универсал газ тұрақтысы.

T, 273 K,     $\Delta H = \frac{104 \cdot 0,0821 \cdot 273}{0,15 \cdot 1,12} = 167 \text{ J/mol}$

C,  $\frac{45}{12} = 3,75$     H,  $\frac{25}{1} = 25$

$\frac{25 \cdot 6,25 - 4 \cdot 1}{6,25 \cdot 6,25} = \dots$     CH<sub>4</sub> - метан.

ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ БІЛІМ АЛҒЫ ҚИМДІ АҒАМЫ  
ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ БІЛІМ АЛҒЫ ҚИМДІ АҒАМЫ  
ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ БІЛІМ АЛҒЫ ҚИМДІ АҒАМЫ

атысушының ишамберін топтыраға арналған аяқ / Поле для заполнения решений участника. Парақ / Страница №

$$4) A_{\text{ауа}} = 2$$

$$V_{\text{ауа}} = ?$$

$$M_{\text{ауа}} = 29 \text{ г/моль}$$

$$M_{\text{қоспа}} = n_{\text{ауа}} \cdot M_{\text{ауа}} = 2 \cdot 29 = 58 \text{ г/моль}$$

Ал қоспа:

$$M_r(C_2H_2) = 12 \cdot 2 + 1 \cdot 2 = 26 \text{ г/моль}$$

$$M_r(SO_2) = 32 + 16 \cdot 2 = 64 \text{ г/моль}$$

$$M_{\text{қоспа}} = n M_r(C_2H_2) + (1-n) M_r(SO_2)$$

$$58 = n \cdot 26 + (1-n) \cdot 64$$

$$58 = 26n + 64 - 64n$$

$$58 - 64 = 26n - 64n$$

$$-6 = -38n$$

$$n = -6 / -38 = 0,158 \text{ (} C_2H_2 \text{)} \text{ және) Метанмен}$$

$$1 - 0,158 = 0,842 \text{ (} SO_2 \text{)} \text{ құқықтағы қоспа (сұрақ)}$$

$$0,158 \cdot 100 = 15,8\% \text{ (} C_2H_2 \text{)}$$

$$0,842 \cdot 100 = 84,2\% \text{ (} SO_2 \text{)}$$

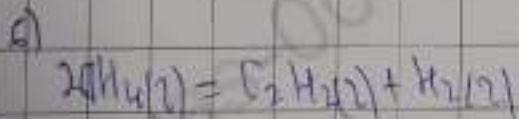
Қатысушының шешімдерін топтырауға арналған өріс / Поле для заполнения решений участника Парақ / Страница №

1)  $pH = 7.8$   
 $H_2S?$

2)  $50^\circ - 2 \text{ м } H_2O$   
 $80^\circ - 1 \text{ м } H_2O$   
 30 пәсәс. то 2/0, 1, 10, 1/10

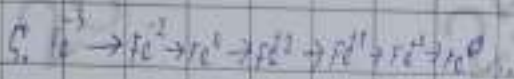
3)  
 $H - 25\%$   
 $C - 75\%$

4)  
 $S - 32 \text{ ат.м.}$



Қатысушының шешімдерін талтыруға арналған өріс / Поле для заполнения решений участника Парах / Страница №

2.  $50^\circ - 2 \text{ мм} \text{ қосыл}$   $80^\circ - 50^\circ = 30$   $80^\circ - 50^\circ = 30$   $80^\circ - 2 \text{ мм}$   
 $80^\circ - 30$   $2 \text{ мм} = 1.2 \text{ мм} = 120$   $1.2 \text{ мм} = 1.2 \text{ мм} = 120$



6.  $2 \text{ C}_2\text{H}_2 = \text{C}_2\text{H}_4 + \text{C}_2$   
 $\frac{166.2}{166.2} \quad \frac{16.4}{16.4} \quad \frac{16}{16}$

1.  $n_H = 2, 8$

$n_1 = 4, 2$

2.  $S = 2, n_C = 4, n_H = 2, 4, n_O = 2, 4, n_N = 2, 4$

3.  $n_H = 10, n = 11$



Катэгорыя і нумары паліграфіі арнамант / Поле для зазначэння рэдакцыйнага ўдзельніка Парак / Страница №

$$1) \text{pH} = 2,3 \quad \text{pH} = -\log [\text{H}^+]$$

$$[\text{H}^+] = 10^{-\text{pH}} = 10^{-2,3}$$

$$[\text{H}^+] \approx 1,58 \times 10^{-3} \text{ M}$$

$$K_w = [\text{H}^+] [\text{OH}^-] = 1,0 \cdot 10^{-14}$$

$$[\text{OH}^-] = \frac{K_w}{[\text{H}^+]} = \frac{1 \cdot 10^{-14}}{1,58 \cdot 10^{-3}}$$

$$[\text{OH}^-] \approx 6,31 \cdot 10^{-12} \text{ M}$$

$$2) T_1 = 50^\circ$$

$t_1 = 2 \text{ мин} / 10 \text{ сек} / 10 \text{ сек}$

$$T_2 = 10^\circ$$

$$t_2 = ?$$

$$5^\circ = 16 \text{ секунд}$$

$$60^\circ - 50^\circ = 30^\circ$$

$$30^\circ = 33 \text{ секунд}$$

$$160^\circ - 30^\circ = 62 \text{ секунд} = 1 \text{ мин} 2 \text{ сек}$$

$$50^\circ = 160 \text{ сек}$$

$$60^\circ = X \text{ сек}$$

$$3) \mu = \frac{AKT}{pV}$$

$$R = 0,0821$$

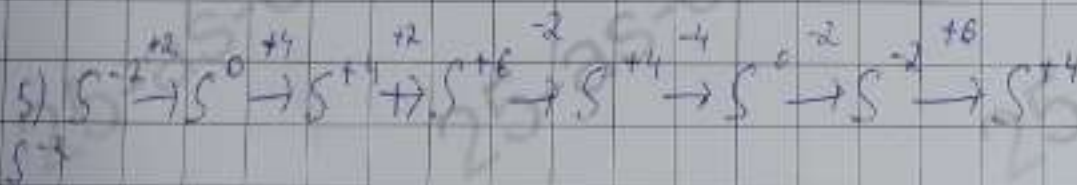
$$T = 273 \text{ K}$$

$$\mu = \frac{(0,4 \cdot 0,0821 \cdot 273)}{0,5 \cdot 1,12} = 16 \text{ г/мл}$$

$$C = \frac{75}{12} = 6,25 \quad ; \quad H = \frac{25}{1} = 25$$

$$\frac{25}{6,25} = \frac{6,25}{6,25} = 4:1$$

$C_{H_2} - \text{метан}$



$$4) d_{\text{ауа}} = 2$$

$$V_{\text{ауа}} = ?$$

$$M_{\text{ауа}} = 29 \text{ г/моль}$$

$$M_{\text{ауа}} = d_{\text{ауа}} \cdot M_{\text{ауа}} = 2 \cdot 29 = 58 \text{ г/моль}$$

$$M_{\text{г}}(\text{C}_2\text{H}_2) = 12 \cdot 2 + 1 \cdot 2 = 26 \text{ г/моль}$$

$$M_{\text{г}}(\text{SO}_2) = 32 + 16 \cdot 2 = 64 \text{ г/моль}$$

$$M_{\text{ауа}} = n M_{\text{г}}(\text{C}_2\text{H}_2) + (1-n) M_{\text{г}}(\text{SO}_2)$$

$$58 = n \cdot 26 + (1-n) \cdot 64$$

$$58 - 64 = 26n - 64n$$

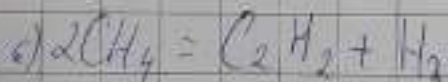
$$-6 = -38n$$

$$n = -6 / -38 = 0,158 \text{ (C}_2\text{H}_2)$$

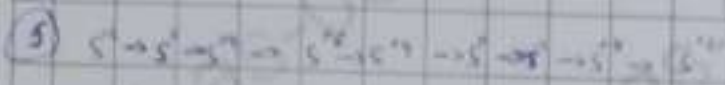
$$1 - 0,158 = 0,842 \text{ (SO}_2)$$

$$0,158 \cdot 100 = 15,8\%$$

$$0,842 \cdot 100 = 84,2\%$$



Қатысушының аты-жынысын толықтыруға арналған кріс / Плат для заполнения сведений участника Парақ / Страница №



4)  $pH = \log [H^+]$

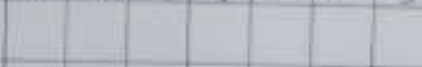
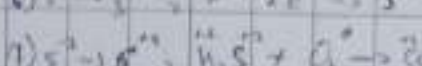
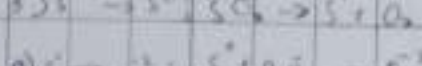
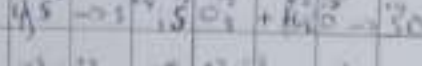
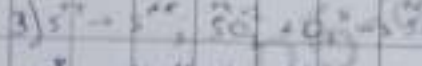
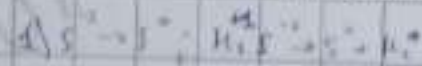
$[H^+] = 10^{-7} = 10^{-14}$

$[H^+] \approx 1,58 \times 10^{-7} M$

$K_w = [H^+] [OH^-] = 1,0 \cdot 10^{-14}$

$[OH^-] = \frac{K_w}{[H^+]} = \frac{1,0 \cdot 10^{-14}}{1,58 \cdot 10^{-7}}$

$[OH^-] \approx 6,33 \cdot 10^{-8} M$



2)  $\frac{V_2}{V_1} = \gamma \frac{T_2 - T_1}{T_0} = 2 \frac{20 - 5}{10} = 2 \frac{15}{10} = 2^3 = 8$   $t = 100/P = 200/P$

3)  $M = \frac{nRT}{PV}$   $R = 0,0821$  - универсальная газовая постоянная  
 $T = 223 K$

$M = \frac{(0,4 - 0,0821 \cdot 223)}{0,5 \cdot 1,13} = 1,62 \text{ г/моль}$

$C = \frac{75}{12} = 6,25$   $H = \frac{25}{1} = 25$

$\frac{25}{6,25} = \frac{C,25}{1,25} = 4:1$   $CH_4$  - метан

4)  $d_{\text{ауа}} = 2$

$V_{\text{ауа}} = ?$

$M_{\text{ауа}} = 2,9 \text{ г/моль}$

$M_{\text{метан}} = 16 \text{ г/моль}$

$M_r(C_2H_6) = 12 \cdot 2 + 1 \cdot 6 = 30 \text{ г/моль}$

$M_r(SO_2) = 32 + 16 \cdot 2 = 64 \text{ г/моль}$

$M_{\text{метан}} = n M_r(C_2H_6) + (1-n) M_r(SO_2)$

$58 = n \cdot 30 + (1-n) \cdot 64 = 64 - 34n$

$58 = 64 - 34n$

$58 - 64 = -34n$

$-6 = -34n$

$n = 6 / 34 = 0,176$  ( $C_2H_6$  - газ метан)

$1 - 0,176 = 0,824$  ( $SO_2$ )

$0,824 \cdot 100 = 82,4\%$  ( $SO_2$ )

Калькулятор разрешен только для вычисления arcs / Поле для заполнения фамилии участника Парад / Страница №

√2

$$50^\circ \rightarrow 2 \text{ мм} \quad 40 \text{ см} = 160 \text{ см}$$

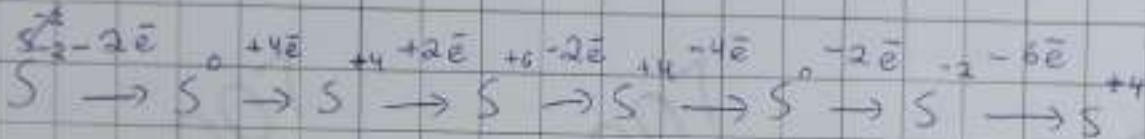
$$80^\circ \rightarrow x$$

$$\frac{50^\circ}{80^\circ} = \frac{160}{x} \quad x = \frac{160 \cdot 80}{50} = \frac{1280}{5} = 256$$

$$x = 256 \text{ см} \leftarrow 4 \text{ мм} \quad 16 \text{ см}$$

$$80^\circ \rightarrow 4 \text{ мм} \quad 16 \text{ см}$$

√5



√8 √3

$$\mu = \frac{mRT}{pV}$$

R = 0.0821 - универсальная газовая постоянная  
T = 223 K

$$\mu = \frac{(0.4 \cdot 0.0821 \cdot 223)}{0.5 \cdot 1.12} = 162 / \text{моль}$$

$$C = \frac{25}{12} = 6.25 \quad H = \frac{25}{1} = 25$$

$$\frac{25}{6.25} : \frac{6.25}{6.56} = 4:3 \quad \text{CH}_4 - \text{метан}$$

N1.

$$pH = -\log [H^+]$$

$$[H^+] = 10^{-pH} = 10^{-2.8}$$

$$[H^+] \approx 1,58 \times 10^{-3} \text{ M}$$

$$K_w = [H^+][OH^-] = 10 \cdot 10^{-14}$$

$$[OH^-] = \frac{K_w}{[H^+]} = \frac{1 \cdot 10^{-14}}{1,58 \cdot 10^{-3}}$$

$$[OH^-] \approx 6,31 \cdot 10^{-12} \text{ M}$$

N4.

$$d_{\text{газ}} = 2$$

$$V_{\text{газ}} = ? \quad M_{\text{газ}} = ?$$

$$M_{\text{газ}} = 29,2 \text{ (мол.масса)}$$

$$M_{\text{газ}} = d_{\text{газ}} \cdot M_{\text{газ}} = 2 \cdot 29,2 = 58,4 \text{ г/моль}$$

$$M_1 (C_2H_2) = 12 \cdot 2 + 1 \cdot 2 = 26 \text{ г/моль}$$

$$M_2 (SO_2) = 32 + 16 \cdot 2 = 64 \text{ г/моль}$$

$$M_{\text{газ}} = n M_1 + C_2H_2 + (1-n) M_2 SO_2$$

$$58,4 = n \cdot 26 + (1-n) \cdot 64$$

$$58,4 = 26n + 64 - 64n$$

$$58,4 - 64 = 26n - 64n$$

$$-6 = -38n$$

$$n = -6 / -38 = 0,158 \text{ (} C_2H_2 \text{ - ацетилен)}$$

$$1 - 0,158 = 0,842 \text{ (} SO_2 \text{ - күштірт диоксиді)}$$

$$0,158 \cdot 100 = 15,8\% \text{ (} C_2H_2 \text{)}$$

$$0,842 \cdot 100 = 84,2\% \text{ (} SO_2 \text{)}$$