2021 – I var yechimlari:

Sardor Voxidov

1. 2 l eritma tarkibidagi kationlarning miqdori 0,12 mol, anionlarning konsentratsiyasi CM = 0,12 M li bo'lgan eritmaga lakmus tushirilganda indikator ko'k rangga bo'yaladi. Qaysi modda eritmasi keltirilgan (a = 1)

A) $Ba(OH)_2$ B) NaOH C) HCl D) H_2SO_4

kation → 0,12mol | I
anion → 0,12mol/l · 2 = 0,24mol | 2

lakmus ko'karishi kerak demak asos.

Javob: $Ba(OH)_2$

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2. Propil spirtining suvli eritmasiga natriy metali tua'sir ettirilganda reaksiya to'liq sodir bo'ldi va 6,72 l (n.sh.) gaz ajraldi Hosil bo'lgan natriyli birikmalarning massalari yig'indisi 28,2 g bo'lsa, dastlabki eritmadagi propil spirtining massasini toping.

A) 9 B) 6 C) 3 D) 12

$$2C_3H_7OH + 2Na \rightarrow 2C_3H_7ONa + H_2$$

120x ——— 164x —— x

$$2H_2O + 2Na \rightarrow 2NaOH + H_2$$

36y ——— 80y —— y

$$\begin{cases} 164x + 80y = 28,2 \\ x + y = 0,3m \end{cases} \quad -80$$

$$84x = 4,2$$

$$x = 0,05$$

$$y = 0,25$$

$$C_3H_7OH = 120 \cdot 0,05 = 6g$$

$$H_2O = 36 \cdot 0,25 = 9g$$

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3. A_2 va B_2 gazlari 2:1 mol nisbatda olingan aralashma quyidagi ($A_2 + B_2 \leftrightarrow 2AB$) reaksiya bo'yicha ta'sirlashganda kimyoviy muvozanat qaror topganda AB moddaning miqdori A_2 va B_2 moddalarning miqdorlari yig'indisiga teng bo'lsa, muvozanat konstantasini toping. (V = 1 litr)

A) 7,2 B) 6,4 C) 4 D) 12

$$\underset{x}{A_2} + \underset{x}{B_2} \rightarrow \underset{2x}{2AB}$$

$$[A_2] + [B_2] = [AB]$$

$$(2 - x) + (1 - x) = 2x$$

$$3 - 2x = 2x$$

$$3 = 4x$$

$$x = 0{,}75m$$

$$[A_2] = 2 - 0{,}75 = 1{,}25m$$

$$[B_2] = 1 - 0{,}75 = 0{,}25m$$

$$[AB] = 1{,}5m$$

$$K_M = \frac{1{,}5^2}{1{,}25 \cdot 0{,}25} = 7{,}2$$

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4. 1) $FeS_2 + O_2 = Fe_2O_3 + SO_2$

2) $Cr_2O_3 + Br_2 + NaOH = Na_2CrO_4 + NaBr + H_2O$

1 – reaksiyadan hosil bo'lgan metall oksidi va

2 – reaksiyadan hosil bo'lgan kislorodli tuzning miqdorlari teng bo'lib, massalarining farqi 8 g bo'lsa, sarflangan ishqorning miqdorini (mol) toping. A) 40 B) 30 C) 20 D) 10

160g ——— 162g ——— 2g = Δ

Fe_2O_3 ——— Na_2CrO_4

1m ——— 1m ——— 2g

4m = x ——— 8g

$Cr_2O_3 + 3Br_2 + 10NaOH = 2Na_2CrO_4 + 6NaBr + 5H_2O$

10m ——— 2m

20m = x ——— 4m

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5. 8 % qo’shimchasi bo’lgan dolomit parchalanganda 89,6 l (n.sh.) gaz ajralgan bo’lsa, dastlabki namunaning massasini toping.

A) 200 B) 500 C) 600 D) 400

$$CaCO_3 \cdot MgCO_3 \rightarrow CaO + MgO + 2CO_2$$

184g ——— 2mol

x ——— 4m → 89,6 litr

x = 368g ——— 92%

x ——— 100%

x = 400g

6. Teng massada olingan siklobutan va kislorod aralashmasi portlatilganda 8,96 l (n.sh.) CO_2 ajraldi. Reaksiyada qaysi moddadan necha gramm ortib qoladi?

A) 13,6 g siklobutan
B) 12,8 g kislorod
C) 16 g kislorod
D) 11,2 g siklobutan

$C_4H_8 + 6O_2 \rightarrow 4CO_2 + 4H_2O$

56g — 192g — 4m

y — x — 0,4m

y = 5,6g x = 19,2g

19,2 – 5,6 = 13,6g

C_4H_8

192 — 192g

$C_4H_8 + 6O_2 \rightarrow 4CO_2 + 4H_2O$

56g — 192g — 4m

136g — 4m

x — 0,4m

x = 13,6g

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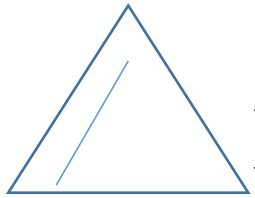
7. Propadiyening izomerlari soni nechta?

A) 1 B) 2 C) 3 D) 4

$C = C = C$

$C \equiv C - C$

} 2 ta



hisoblanmagan

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8. Quyidagi moddalari σ – bog'lar soni kamayib borish tartibida joylashtiring.

A) SiH_4, PH_3, N_2, SO_2 B) SiH_4, PH_3, SO_2, N_2

C) PH_3, SiH_4, N_2, SO_2 D)PH_3, SiH_4, SO_2, N_2

9. $CaBr_2$ ning 400 ml 40 % li (p = 1,25 g/ml) bo'lgan to'yingan eritmasi sovutilganda 116 g $CaBr_2 * 5H_2O$ cho'kmaga tushgan bo'lsa, hosil bo'lgan keyingi eritmadagi Ca^{2+} ionlarini to'liq cho'ktirish uchun 40 % li natriy fosfat eritmasidan necha gramm talab etailadi? (a = 1)A) 82 B) 328 C) 164 D) 200

$400ml \cdot 1,25 \rightarrow 500g \cdot 0,4 = 200g$

$\frac{200g}{200} = 1m \rightarrow CaBr_2$

$CaBr_2 \cdot 5H_2O$

290g ——— 1m

116g ——— x

x = 0,4mol

1 – 0,4 = 0,6mol

$3CaBr_2 + 2Na_3PO_4 \rightarrow Ca_3(PO_4)_2 + 6NaBr$

3m ——— 2m

0,6m ——— x

$x = 0,4m \cdot 164 = 65,6g$ ——— 40%

x ——— 100%

x = 164g

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10. L qavatida 8 ta, M qavatida 5 ta elektroni bo'lgan atomga tegishli fikrni tanlang.

A) faqat asosli oksid hosil qiladi

B) ham asosli, ham kislotali oksid hosil qiladi

C) faqat kislotali oksid hosil qiladi

D) vodorodli birikmasi uchuvchan emas

K = 2

L = 8

M = 5

15(e) → P

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11. Beda ekilgan yerning 1 gektori azotni bog'lovchi moddalar hisobiga 140 kg azotni o'zlashtiradi. 1 gektor beda ekilgan maydon o'zlashtiradigan azot necha mol havo tarkibida bo'ladi?

A) 5000 B) 6250 C) 7500 D) 3750

$$1 \cdot 140\text{kg} = \frac{140\text{kg}}{28} = 5\text{kmol} \rightarrow 5000\text{mol}$$

80% — 5000mol

100% — x

$$x = 6250\text{mol}$$

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12. Quydagi reaksiyalar asosida A moddaning gomologini toping.

$C_2H_5OH \xrightarrow{kat\ t^o} A + B + X$

$B + O_2 \rightarrow X$

A) taluol B) Propadiyen C) butin D) penten

$2C_2H_5OH \xrightarrow{kat\ t^o} \underset{A}{CH_2 = CH - CH = CH_2} + \underset{B}{H_2} + \underset{X}{H_2O}$

$$HNO_3 + A \xrightarrow{H_2SO_4, t^\circ} X + H_2O$$

$$H_2 + X \rightarrow B + H_2O$$

etin $\xrightarrow{C_{aktiv}, t^\circ} A$

Ushbu reaksiyalar asosida B moddani aniqlang.

A) $C_6H_5CH_3$ B) $C_6H_5NH_3Cl$

C) $C_6H_5NO_2$ D) $C_6H_5NH_2$

$$C_2H_2 \rightarrow C_6H_6$$

A X

$$HNO_3 + C_6H_6 \rightarrow C_6H_5NO_2 + H_2O$$

$$3H_2 + C_6H_5NO_2 \rightarrow C_6H_5NH_2 + 2H_2O$$

B

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14. Dietilamin, dimetiletilamin va metilpropilamindan iborat 292 g aralashmani yoqish uchun sarflanadigan kislorodning miqdorini (mol) toping.

A) 27 B) 9 C) 36 D) 18

$$4C_4H_{11}N + 27O_2 \rightarrow 16CO_2 + 2N_2 + 22H_2O$$

292g——27m

292g——x = 27mol

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15. Kislorod va noma’lum gaz aralashmasining vodorodga nisbatan zichligi 11,5 ga teng bo’lsa, noma’lum gazni toping.

A) PH_3 B) C_2H_6 C) CH_4 D) SiH_4

$$11{,}5 \cdot 2 = 23 \text{g/mol}$$

$$X + O_2$$

$$X < 23 < 32$$

$$x < 23$$

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16. Kalsiy gidropirofosfatning ekvivalent massasini toping.

A) 235/6 B) 235/2 C) 470 D) 235/3

$$Ca_3(HP_2O_7)_2 = \frac{470\text{g/mol}}{6} = 235/3$$

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17. 2 valentli metall sulfidi tarkibidagi oltingugurt va metall atomlarining massa nisbati 1:2 bo'lsa, metall sulfidning molar massasini (g/mol) aniqlang.

A) 96 B) 72 C) 144 D) 169

$$MeS$$

$$32 \cdot 2 = 64g \rightarrow Cu$$

$$CuS \rightarrow 96g/mol$$

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18. CH_4 , SO_2 va X gazlar aralashmasining vodorodga nisbatan zichligi 18 ga teng bo'lsa, noma'lum gazni aniqlang. V(CH_4)=$V(SO_2)$ va m(SO_2) = m(X)

A) etilan, azot (II) – oksid
B) silan, kislorod
C) azot, etilen
D) fosfin, vodorod sulfid

$$1CH_4 + 1SO_2 + a\,X$$

1m —— 1m —— a

16g —— 64g —— 64g

144g

$$M = \frac{144g}{1 + 1 + a} = 36\ (18 * 2)$$

$$144 = 72 + 36a$$

$$a = 2mol$$

X

64g —— 2m

x —— 1m

$x = 32g/mol \rightarrow O_2, SiH_4$

19. Quyidagi jadvaldan barchasi to'g'ri bo'lganlarni tanlang.

№	Molekula formulasi	Molekuladagi $\bar{e}$ lar soni	Metall soni	Sinfi
1	$BaCO_3$	86	~~2~~	Tuz
2	$NaOH$	20	I	~~Tuz~~
3	$Ca(OH)_2$	38	I	~~Kislota~~
4	F_2O	26	0	Oksid

A) 1 B) 4 C) 3 D) 2

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20. I litr azot (II) oksidga 25 litr havo aralashtirildi. Hosil bo‘lgan aralashmadagi NO_2 va O_2 hajmiy nisbatlarini toping.

A) I:4.5 B) I:5 C) 2:3 D) I:7

I litr 5 litr

$2NO + O_2 \rightarrow 2NO_2$

2 —— I —— 2

I —— x —— y = I

x = 0,5

$25 \cdot 0{,}2 = 5$ litr (O_2)

$NO_2 = I$

$O_2 = 5 - 0{,}5 = 4{,}5$

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21. Eritmadagi Ba^{2+} ionlarini to‘liq cho‘ktirish uchun K_3PO_4 $BaCl_2$ dan 4 g kam sarf bo‘lgan. Sarf bo‘lgan K_3PO_4 ning mol miqdorini aniqlang.

A) 0.4 B) 0.02 C) 0.08 D) 0.04

$$3BaCl_2 + 2K_3PO_4 \rightarrow Ba_3(PO_4)_2 + 6KCl$$

624g——424g —— 1m ——6m

$\Delta = 624 - 424 = 200$g—— 2m

4g—— x = 0,04mol

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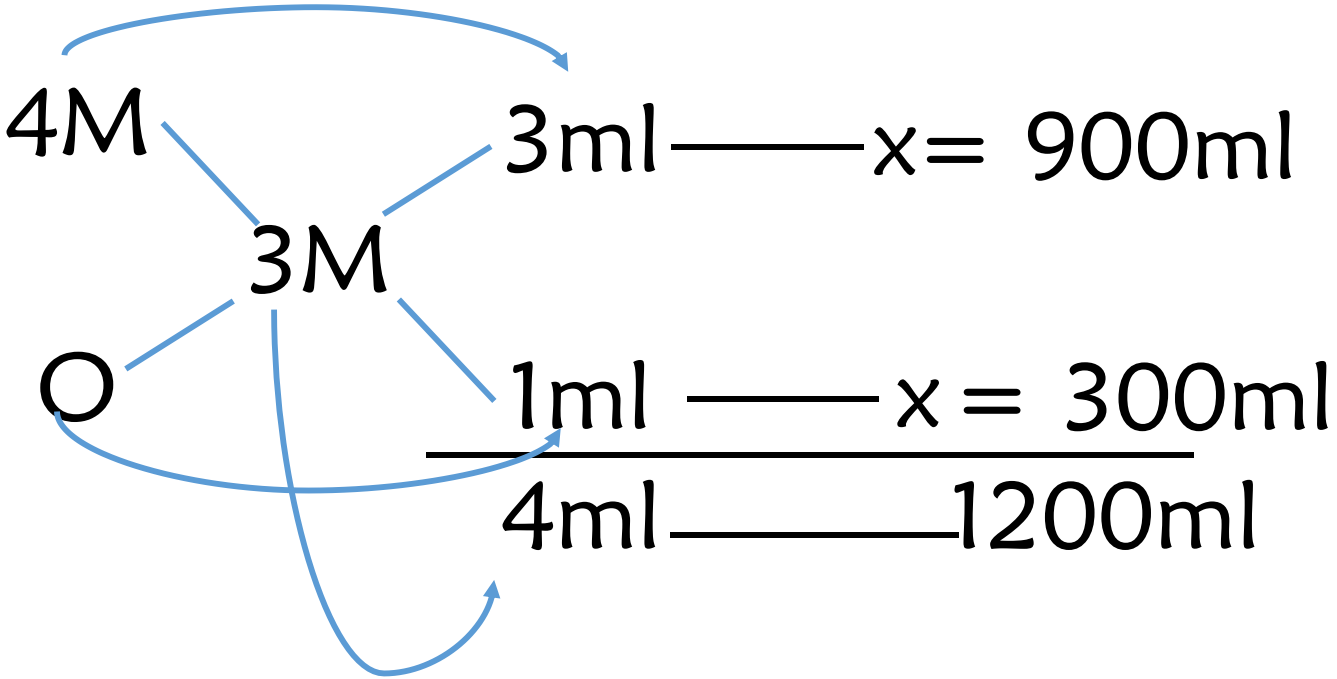
22. 4M li eritmaga suv qo‘shilganda 3M li 1,2 litr eritma hosil bo‘lgan bo‘lsa , nazariy jihatdan dastlabki eritma va qo‘shilgan suv miqdorini aniqlang!

A) 500 ; 700 B) 800 ; 400

C) 600 ; 600 D) 900; 300



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a) Silan b)Fosfin, c)Sianid d)oksalat kislota molekulalarini sigma bog'larini kamayib borish tartibida joylashtiring

A) a > d > b > c

B) d > c > b > a

C) d > a > b > c

D) c > b > a > d

24. Laboratoriya sharoitida "sun'iy vulqon" reaksiyasida qaysi gaz hosil bo‘ladi!

A) CO_2 B) NH_3 c) SiH_4 D) N_2

$$(NH_4)_2Cr_2O_7 \rightarrow N_2 + 4H_2O + Cr_2O_3$$

↓

Suniy vulqon reaksiyasi

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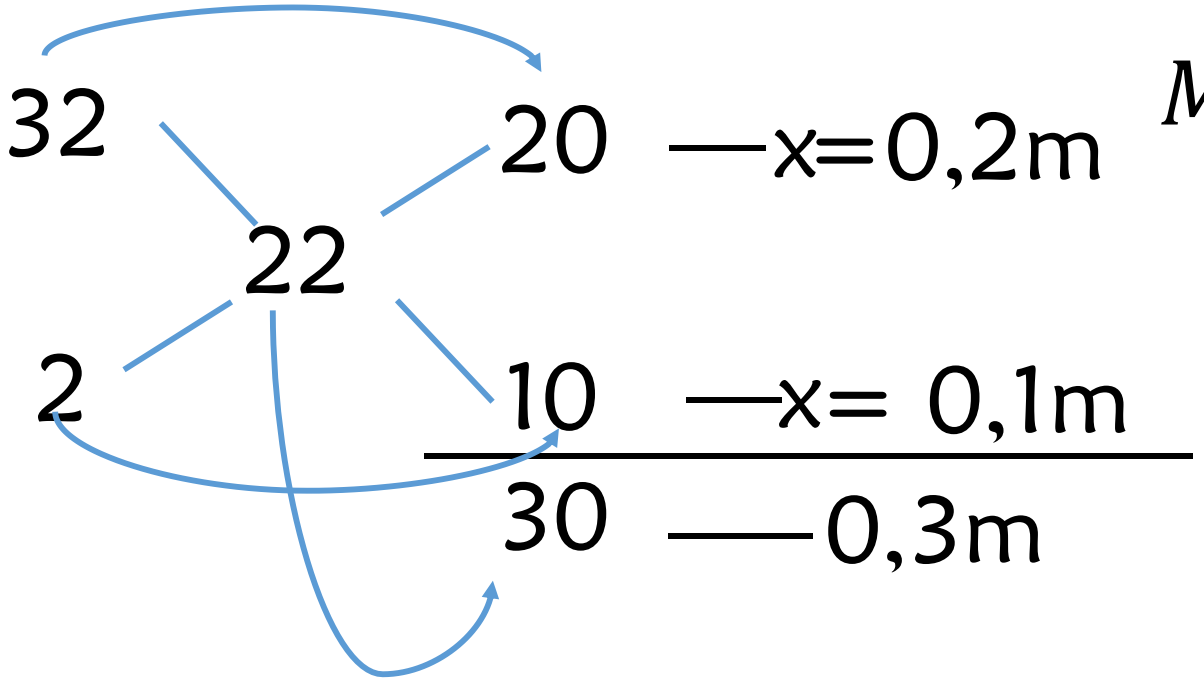
25. Mg_2Si va Mg dan iborat aralashma HCl eritmasida eritilganda vodorodga nisbatdan zichligi 11 bo‘lgan 6,72litr(n.Sh) gaz aralashmasi hosil bo‘ldi. Shu jarayonda hosil bo‘lgan tuz massasi topilsin.

A) 95 B) 47,5 C) 38 D) 57



$$Mg_2Si + 4HCl = 2MgCl_2 + SiH_4$$
0,4m——0,2m

$$Mg + 2HCl = MgCl_2 + H_2$$
0,1m——0,1m

$0{,}4m + 0{,}1m = 0{,}5m \cdot 95g = 47{,}5g$
$MgCl_2$

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26. Noma'lum asosning 426g suvli eritmasida dissosiyalanmagan molekulalar 17 mol, ionlar esa 6 mol bo'lsa. Shu eritmada erigan modda massasi topilsin. (a=
1) A) 168 B) 112 C) 80 D) 120

$H_2O = 17m \cdot 18g = 306g$

ishqor: $426g - 306g = 120g$

$MeOH \leftrightarrow Me^+ + OH^-$

1m ——— 2m (ion)

x ——— 6m

x = 3m ——— 120g

1m ——— x x = 40g/mol → NaOH

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27. 1964g HNO_3 eritmasiga xg KOH qo‘shilganda KNO_3 ning massa ulushi 5% bo‘lgan eritma olindi, agar kislotaning yarmi sarflangan bo‘lsa qolgan qismi Na bilan neytrallanganda suv bug‘lanmagan. Hosil bo‘lgan eritmaga qanday massada (g) suv qo‘shilganda 1,7% $NaNO_3$ saqlagan eritma hosil bo‘ladi? A) 1966 B) 4200 C) 2900 D) 2958

$$HNO_3 + KOH = KNO_3 + H_2O$$
x ——— 56x ——— 101x

$$C_{\%} = \frac{101x}{1964 + 56x} = 0{,}05$$

$$x = 1$$

1 mol HNO_3 sarflandi, 1 mol ortdi.

$$HNO_3 + NaOH = NaNO_3 + H_2O$$
1m ——— 1m ——— 1m → 85g

$$2Na + 2H_2O = 2NaOH + H_2$$
46g ——— 2m ——— 2g

x ——— 1m ——— y

$x = 23g$ $y = 1g$

Jami eritma massasini topamiz.

$1964 + 56 + 23 - 1 = 2042g$

Oxirgi eritmani topamiz.

85g ——— 1,7%

x ——— 100%

$x = 5000g - 2042g = 2958g$

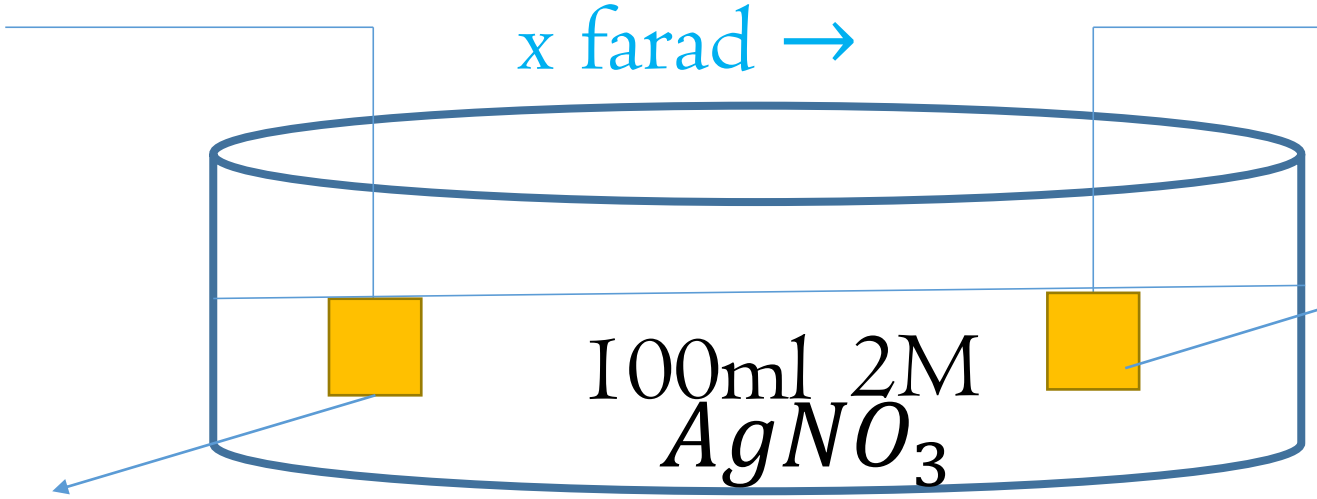
28. Kordinatsion bog'lanishga tegishli moddalar qatorini aniqlang.

A) CO, O_2, $NaNO_3$ B) CO_2, HNO_3, N_2

C) $FeSO_4$, ZnO, H_2 D) $K_3[Fe(CN)_6]$, O_3, $Ni(CO)_5$

29. Teng massali mis elektrodlar yordamida 100 ml 2 M li kumush nitrat elektroliz qilindi . Jarayon oxirida elektrodlarning massa farqi 60 gr bo'lsa eritmadan o'tgan faradni toping.

A) 0.7 B) 1,4 C) 1,0 D) 1.2



$(x) \cdot 32$ Cu

0,2m Ag

$(x - 0{,}2) \cdot 32$ Cu

$(0{,}2 \cdot 108 + (x - 0{,}2) \cdot 32) + 32x = 60$

$21{,}6 + 32x - 6{,}4 + 32x = 60$

$64x = 44{,}8$

$x = 0{,}7F$ Sardor Voxidov

30. 225 g 24% li $CuCl_2$ eritmasi to'liq elektroliz qilindi. Hosil bo'lgan gaz 11,6g Fe va Mg aralashmasi bilan to'liq ta'sirlashsa, metallarning massa farqini aniqlang.

A) 1,6 B) 10,8 C) 0,4 D) 2,4

$$225g \cdot 0{,}24 = 54g \; {}^{CuCl_2}/_{135g} = 0{,}4m$$

$$CuCl_2 \rightarrow Cu + Cl_2$$

$$\begin{matrix} 1m & \text{———} & 1m \\ 0{,}4m & \text{———} & x = 0{,}4m \end{matrix}$$

$$2Fe + 3Cl_2 = 2FeCl_3$$

$$\begin{matrix} 112x & \text{——} & 3x \end{matrix}$$

$$Mg + Cl_2 = MgCl_2$$

$$\begin{matrix} 24y & \text{——} & y \end{matrix}$$

$$\begin{cases} 112x + 24y = 11{,}6 \\ 3x + y = 0{,}4 \end{cases}$$

$$x = 0{,}05 \cdot 112 = 5{,}6g$$

$$y = 0{,}25 \cdot 24 = 6g$$

$$6 - 5{,}6 = 0{,}4g \; \Delta$$

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