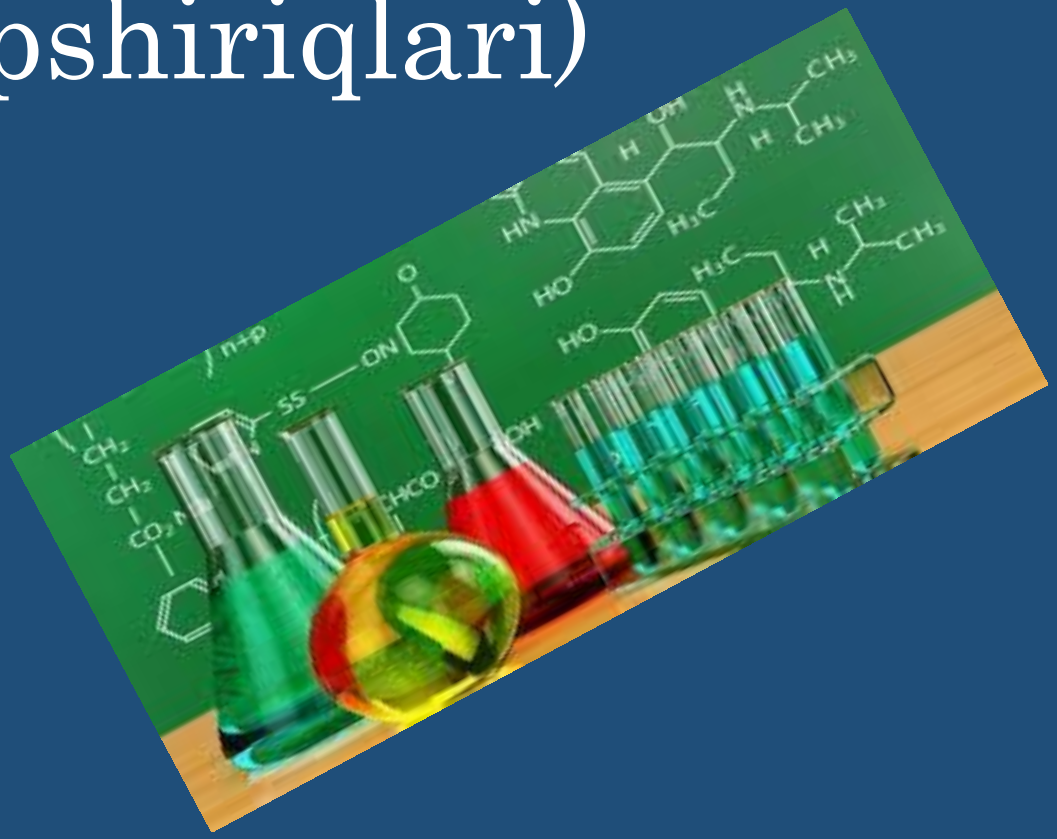
Kimyo fanidan milliy test tizimi uchun namunaviy test topshirig‘ining yozma ish (kengaytirilgan javobni talab qiladigan ochiq test topshiriqlari) tahlili.

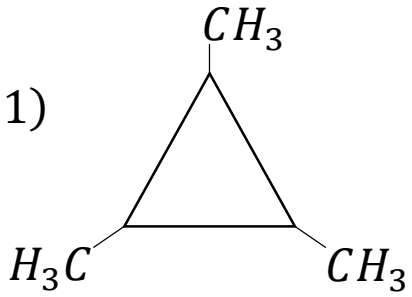


42-topshiriq

- Mazkur topshiriq 7 ta banddan iborat
- Ajratilgan maksimal ball 25 ballni tashkil etadi (M-25 ball)

42-topshiriq matni

- Organik moddalarning xossalarini bilgan holda reaksiya tenglamalarini tugallang va tenglashtiring. Hosil bo‘lgan barcha organik moddalarning tuzilish formulasini yozing. 1-, 2-, 5-reaksiyalarda hosil bo‘lgan organik mahsulotlarni sistematik nomenklatura bo‘yicha nomlang.

1) 

$+H_2 \xrightarrow{t^0, Pt}$

2) $H_3C - CH = CH - CH_3 + KMnO_4 + H_2O \xrightarrow{20^0C}$

3) $H_3C - C \equiv C - CH_3 + KMnO_4 + H_2SO_4 \rightarrow$

4) $C_6H_{12}O_{6\,(glukoza)} + [Ag(NH_3)_2OH] \rightarrow$

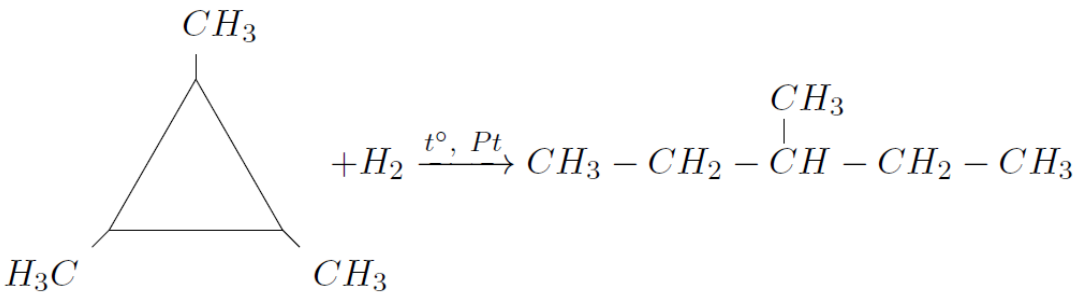
5) $H_3C - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - COONa + H_2O \xrightarrow{elektroliz}$

6) $H_2C = CH - CH_3 +$  $\xrightarrow{AlCl_3}$

7) $H_3CCCl_2CH_2CH_3 + KOH \xrightarrow{suvli\ eritma,\ gidroliz}$

Ushbu topshiriqni bajarishda reaksiya tenglamalarini tugallash, tenglash, hosil bo`lgan organik moddalarning tuzilish formulasini yozish va talab etilgan moddalarni nomlash zarur.

1)



$$+H_2 \xrightarrow{t^\circ,\ Pt} CH_3 - CH_2 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - CH_3$$

3-metilpentan

a) reaksiya tenglamasi to‘g‘ri tugallangan bo‘lsa, 1 ball;
b) hosil bo‘lgan organik moddaning tuzilishi to‘g‘ri yozilgan bo‘lsa, 1 ball;
c) hosil bo‘lgan organik modda to‘g‘ri nomlangan bo‘lsa, 1 ball.
Ushbu band uchun ajratilgan maksimal ball- 3 ball.

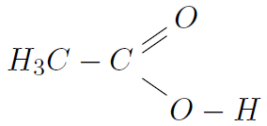
2)

$$3CH_3 - CH = CH - CH_3 + 2KMnO_4 + 4H_2O \rightarrow 3CH_3 - \underset{\displaystyle OH}{\underset{|}{CH}} - \underset{\displaystyle OH}{\underset{|}{CH}} - CH_3 + 2KOH + 2MnO_2$$

butandiol-2,3

a) reaksiya tenglamasi to‘g‘ri tugallangan bo‘lsa, 1 ball;
b) reaksiya tenglamasining chap tomoni to‘g‘ri tenglangan bo‘lsa, 1 ball;
c) reaksiya tenglamasining o‘ng tomoni to‘g‘ri tenglangan bo‘lsa, 1 ball;
d) hosil bo‘lgan organik moddaning tuzilishi to‘g‘ri yozilgan bo‘lsa, 1 ball;
e) hosil bo‘lgan organik modda to‘g‘ri nomlangan bo‘lsa, 1 ball.
Ushbu band uchun ajratilgan maksimal ball- 5 ball.

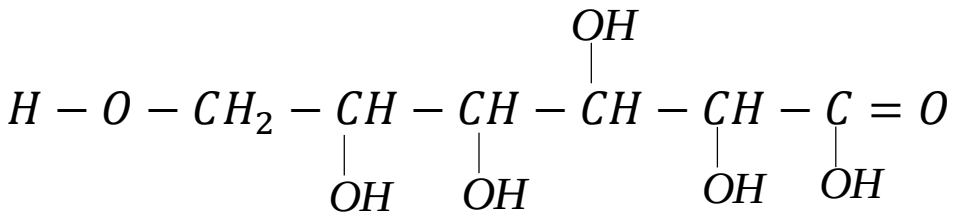
3) $5CH_3 - C \equiv C - CH_3 + 6KMnO_4 + 9H_2SO_4 \rightarrow 10CH_3COOH + 3K_2SO_4 + 6MnSO_4 + 4H_2O$



a) reaksiya tenglamasi to‘g‘ri tugallangan bo‘lsa, 1 ball;
b) reaksiya tenglamasining chap tomoni to‘g‘ri tenglangan bo‘lsa, 1 ball;
c) reaksiya tenglamasining o‘ng tomoni to‘g‘ri tenglangan bo‘lsa, 1 ball;
d) hosil bo‘lgan organik moddaning tuzilishi to‘g‘ri yozilgan bo‘lsa, 1 ball.
Ushbu band uchun ajratilgan maksimal ball- 4 ball.

4) $C_6H_{12}O_6 + 2\left[Ag\left(NH_3\right)_2OH\right] \rightarrow HOCH_2\left(CHOH\right)_4COOH + 2Ag + 4NH_3 + H_2O$

$HOCH_2\left(CHOH\right)_4CHO + 2\left[Ag\left(NH_3\right)_2OH\right] \rightarrow HOCH_2\left(CHOH\right)_4COONH_4 + 2Ag + 3NH_3 + H_2O$



a) reaksiya tenglamasi to‘g‘ri tugallangan bo‘lsa, 1 ball;
b) reaksiya tenglamasi to‘g‘ri tenglangan bo‘lsa, 1 ball;
c) hosil bo‘lgan organik moddaning tuzilishi to‘g‘ri yozilgan bo‘lsa, 1 ball.
Ushbu band uchun ajratilgan maksimal ball- 3 ball.

5) $$2H_3C-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-COONa+2H_2O \xrightarrow{\text{elektroliz}} H_3C-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-CH_2-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_3+2CO_2+H_2+2NaOH$$

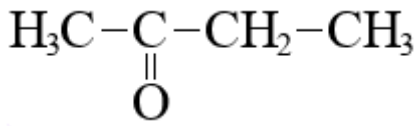
2,5-dimetilgeksan

a) reaksiya tenglamasi to‘g‘ri tugallangan bo‘lsa, 1 ball;
b) reaksiya tenglamasi to‘g‘ri tenglangan bo‘lsa, 1 ball;
c) hosil bo‘lgan organik moddaning tuzilishi to‘g‘ri yozilgan bo‘lsa, 1 ball;
d) hosil bo‘lgan organik modda to‘g‘ri nomlangan bo‘lsa, 1 ball.
Ushbu band uchun ajratilgan maksimal ball- 4 ball.

6) $$H_2C=CH-CH_3+ \bigcirc \xrightarrow{AlCl_3} H_3C-CH-CH_3$$ (с бензольным кольцом у второго атома углерода)

a) reaksiya tenglamasi to‘g‘ri tugallangan bo‘lsa, 1 ball;
b) hosil bo‘lgan organik moddaning tuzilishi to‘g‘ri yozilgan bo‘lsa, 2 ball.
Ushbu band uchun ajratilgan maksimal ball- 3 ball.

7) $H_3CCCl_2CH_2CH_3 + 2KOH \xrightarrow{suvli\ eritma, gidroliz} CH_3COCH_2CH_3 + 2KCl + H_2O$



a) reaksiya tenglamasi to‘g‘ri tugallangan bo‘lsa, 1 ball;
b) reaksiya tenglamasi to‘g‘ri tenglangan bo‘lsa, 1 ball;
c) hosil bo‘lgan organik moddaning tuzilishi to‘g‘ri yozilgan bo‘lsa, 1 ball.
Ushbu band uchun ajratilgan maksimal ball- 3 ball.

43-topshiriq

- Mazkur topshiriq 4 ta banddan iborat
- Ajratilgan maksimal ball 25 ballni tashkil etadi (M-25 ball)

43-topshiriq matni

- Raqamlangan probirkalarda (1,2,3,4,5) turli moddalar eritmalari mavjud. 1-raqamli eritmaga 3-raqamli eritmadan quyish jarayonida avval cho‘kma hosil bo‘ldi, jarayon davom ettirilgach cho‘kma erib ketdi. 1-raqamli probirkadagi eritma tarkibida kationning elektron tuzilishi [Ar] $3d^{10}4s^0$ va anioni esa bariy kationi bilan kislotalarda erimaydigan oq cho‘kma hosil qiladi. 3- va 4-raqamli probirkalardagi eritmalar aralashtirilganda metall oksidi cho‘kmaga tushdi (eritmada $NaNO_3$ hosil bo‘ldi) va bu eritma (idish tubidagi cho‘kma bilan birga) 6-raqamli bo‘sh probirkaga solindi. 3- va 5-raqamli probirkalardagi eritmalar aralashtirilganda ajralgan gaz 6-probirkaga yuttirilganda cho‘kma erib ketdi. 4- va 5-raqamli probirkalardagi eritmalar aralashtirilganda oq pag‘asimon, 2- va 4-raqamli eritmalar aralashtirilganda esa sarg‘ish cho‘kma olindi. 2- va 3-raqamli eritmalar aralashtirilganda “ohak suti” hosil bo‘ldi.
- 1) Berilgan barcha reaksiyalarning (shu jumladan 1-raqamli probirkadagi eritmaning bariy xlorid bilan reaksiyasini ham) molekulyar tenglamalarini yozing. 6-probirkadagi oksidning gaz ta’sirida erish reaksiya tenglamasi bundan mustasno.
- 2) 1-, 2-, 3-, 4-, 5-raqamli probirkalardagi noma’lum moddalarning kimyoviy formulasini probirka raqami bilan moslab yozing.
- 3) 2- va 3-; 2- va 4-; 3- va 4-; 3- va 5-; 4- va 5-raqamli probirkalardagi moddalar orasidagi reaksiyalarning to‘la ionli va qisqa ionli tenglamalarini yozing.
- 4) 6-probirkadagi cho‘kma gaz orqali eritilganda olingan eritma qaysi sinf vakillarining barchasi uchun sifat reaksiyasini beradi? Shu sinfning gomologik qatoridagi ikkinchi vakili uchun ushbu sifat reaksiyasi tenglamasini yozing.
- **Diqqat!** Mazkur topshiriq kengaytirilgan javobni talab etib, uning yechilish usulini javoblar varaqasida aks ettirish lozim.

Topshiriqning 1- va 2-bandlarini bajarishda quyidagi amallar ketma-ketligi bajariladi:

a) Topshiriq shartida so`ralgan reaksiyalarning molekulyar tenglamalari tuziladi va tenglanadi;

b) Probirkalardagi noma'lum moddalar probirka raqami bilan to`g`ri moslab yoziladi.

$(1-3)\ ZnSO_4 + 2NaOH = Zn(OH)_2 \downarrow + Na_2SO_4$ (1 ball)

$(3-4)\ 2NaOH + 2AgNO_3 = Ag_2O \downarrow + 2NaNO_3 + H_2O$ (1 ball)

$(3-5)\ NaOH + NH_4Cl = NaCl + H_2O + NH_3 \uparrow$ (1 ball)

$(4-5)\ AgNO_3 + NH_4Cl = AgCl \downarrow + NH_4NO_3$ (1 ball)

$Zn(OH)_2 + 2NaOH = Na_2[Zn(OH)_4]$ (1 ball)

$(2-3)\ CaBr_2 + 2NaOH = Ca(OH)_2 \downarrow + 2NaBr$ (1 ball)

$(2-4)\ CaBr_2 + 2AgNO_3 = Ca(NO_3)_2 + 2AgBr \downarrow$ (1 ball)

$ZnSO_4 + BaCl_2 \rightarrow ZnCl_2 + BaSO_4 \downarrow$ (1 ball)

Formulasi to‘g‘ri aniqlangan har bir modda uchun 1 balldan, jami 5 ball.

Probirka raqami	Modda
1	rux sulfat
2	kalsiy bromid
3	natriy gidroksid
4	kumush nitrat
5	ammoniy xlorid

Topshiriqning 3- va 4-bandlarini bajarishda quyidagi amallar ketma-ketligi bajariladi:
a) Talab etilgan reaksiyalarning to`la ionli va qisqa ionli tenglamalari yoziladi;
b) Oksidning ammiakli eritmasi qaysi sinf vakillari uchun sifat reaksiyasi borishi aniqlanadi;
c) Shu sinfning gomologik qatordagi ikkinchi vakili bilan reaksiya tenglamasi tuziladi va tenglanadi.

- To`la ionli tenglama — Qisqa ionli tenglama

$Ca^{2+} + 2Br^- + 2Na^+ + 2OH^- = Ca(OH)_2\downarrow + 2Na^+ + 2Br^-$ — $Ca^{2+} + 2OH^- = Ca(OH)_2\downarrow$

$Ca^{2+} + 2Br^- + 2Ag^+ + 2NO_3^- = Ca^{2+} + 2NO_3^- + 2AgBr\downarrow$ — $2Br^- + 2Ag^+ = 2AgBr\downarrow$

$2Na^+ + 2OH^- + 2Ag^+ + 2NO_3^- = Ag_2O\downarrow + 2Na^+ + 2NO_3^- + H_2O$ — $2OH^- + 2Ag^+ = Ag_2O\downarrow + H_2O$

$Na^+ + OH^- + NH_4^+ + Cl^- = Na^+ + Cl^- + H_2O + NH_3\uparrow$ — $OH^- + NH_4^+ = H_2O + NH_3\uparrow$

$Ag^+ + NO_3^- + NH_4^+ + Cl^- = AgCl\downarrow + NH_4^+ + NO_3^-$ — $Ag^+ + Cl^- = AgCl\downarrow$

Har bir to‘liq to‘g‘ri yozilgan reaksiya tenglamalari uchun 1 balldan, jami 10 ball.

- Kumush oksidning ammiakli eritmasi aldegidlar bilan sifat reaksiyasi beradi. Bu sinfning ikkinchi vakili etanal (sirka aldegid).

$$CH_3CHO + 2\left[Ag(NH_3)_2OH\right] \rightarrow CH_3COOH + 2Ag + 4NH_3\uparrow + H_2O$$

$$CH_3CHO + Ag_2O \xrightarrow{ammiakli\ eritma} CH_3COOH + 2Ag$$

- a) noma’lum sinf (aldegidlar) to‘g‘ri topilgan bo‘lsa, 1 ball;
- b) reaksiya tenglamasi to‘g‘ri yozilgan bo‘lsa, 1 ball.