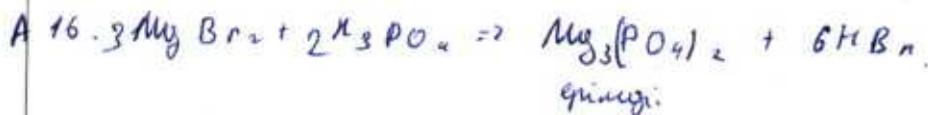
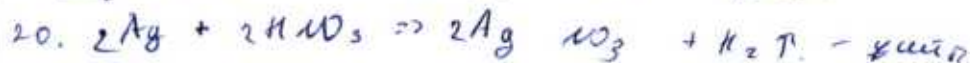
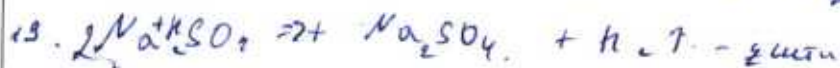
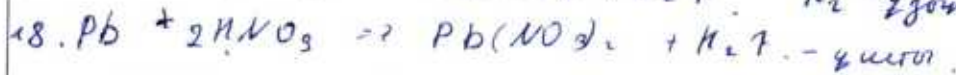
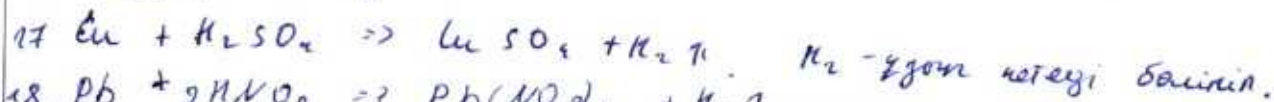


А.2. NaOH , $\text{Al}_2(\text{SO}_4)_3$, CuSO_4 , $\text{Pb}(\text{NO}_3)_2$, MgBr_2 ,
 Na_3PO_4 , Na_2SO_4 , AgNO_3

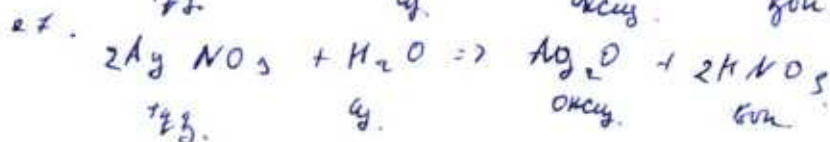
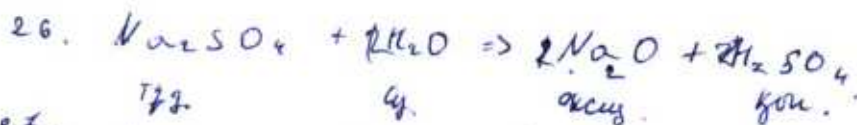
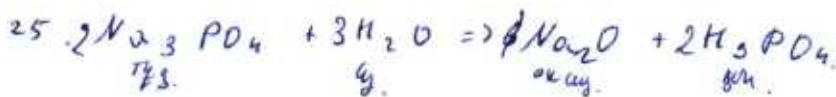
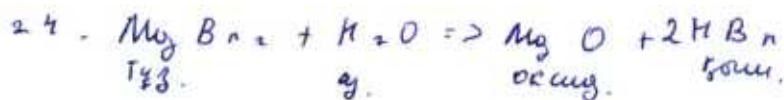
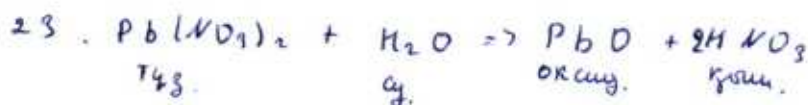
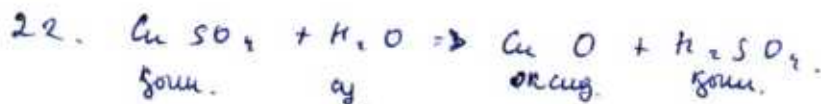
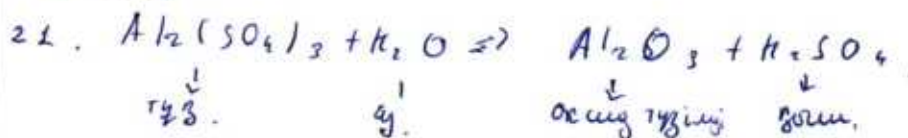
1. $\text{Al} + \text{H}_2\text{SO}_4 \Rightarrow \text{Al}_2(\text{SO}_4)_3 + \text{H}_2\uparrow$ - ериг.
2. $\text{CuO} + \text{H}_2\text{SO}_4 \Rightarrow \text{CuSO}_4 + \text{H}_2\text{O}$ - ериг.
3. $\text{Pb} + 2\text{HNO}_3 \Rightarrow \text{Pb}(\text{NO}_3)_2 + \text{H}_2\uparrow$ - ериг.
4. $\text{Mg} + 2\text{HBr} \Rightarrow \text{MgBr}_2 + \text{H}_2\uparrow$ - ериг.
5. $6\text{Na} + 2\text{H}_3\text{PO}_4 \Rightarrow 2\text{Na}_3\text{PO}_4 + 3\text{H}_2\uparrow$ - ериг.
6. $\text{Na}_2\text{O} + \text{H}_2\text{SO}_4 \Rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$ - ериг.
7. $\text{Ag}_2\text{O} + 2\text{HNO}_3 \Rightarrow 2\text{AgNO}_3 + \text{H}_2\text{O}$ - ериг.
8. $\text{Na} + 2\text{H}_2\text{O} \Rightarrow 2\text{NaOH}$ -
9. $\text{Al}_2(\text{SO}_4)_3 + \text{H}_2\text{SiO}_3 \Rightarrow \text{Al}_2(\text{SiO}_3)_3\downarrow + 3\text{H}_2\text{SO}_4$
 тұз. қосын. тұздар түзіледі қосын.
10. $\text{CuSO}_4 + \text{H}_2\text{S} \Rightarrow \text{CuS}\downarrow + \text{H}_2\text{SO}_4$
 тұз қосын. тұздар еріледі қосын.
11. $\text{Pb}(\text{NO}_3)_2 + 2\text{HF} \Rightarrow \text{PbF}_2\downarrow + 2\text{HNO}_3$
 тұз қосын. ериг. қосын.
12. $\text{MgBr}_2 + 2\text{HF} \Rightarrow \text{MgF}_2 + 2\text{HBr}$
 тұз қосын. еріледі қосын.
13. $\text{Na}_3\text{PO}_4 + 3\text{HBr} \Rightarrow 3\text{NaBr} + \text{H}_3\text{PO}_4$
 тұз қосын. ериг. қосын.
14. $\text{Na}_2\text{SO}_4 + \text{H}_2\text{CO}_3 \Rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{SO}_4$
 тұз қосын. ериг. қосын.
15. $\text{AgNO}_3 + \text{HCl} \Rightarrow \text{AgCl}\downarrow + \text{HNO}_3$
 тұз қосын. еріледі қосын.
- 16.



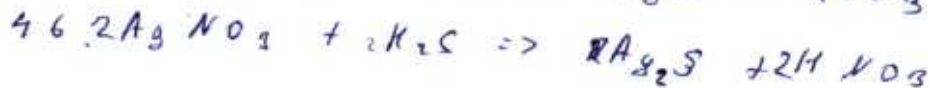
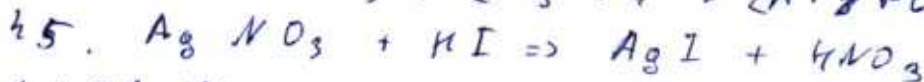
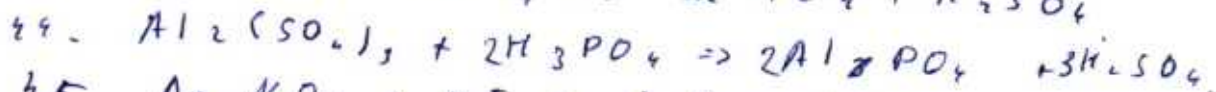
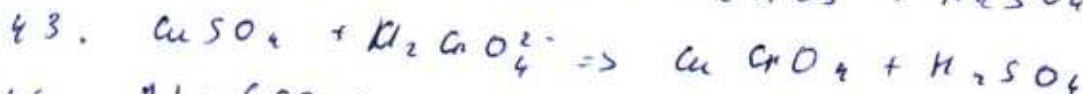
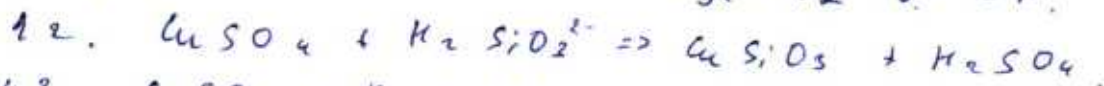
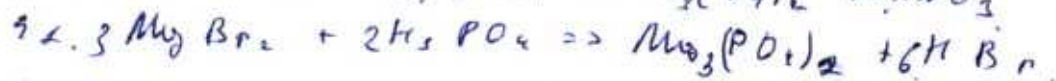
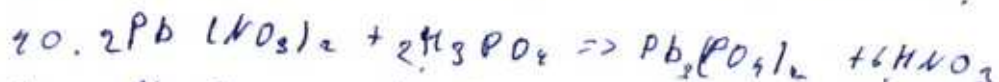
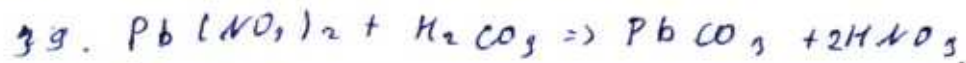
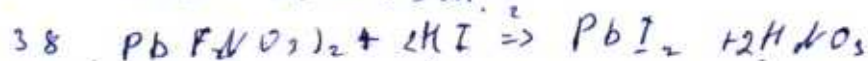
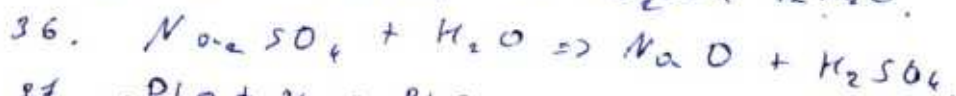
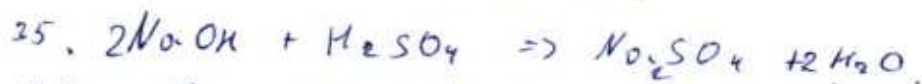
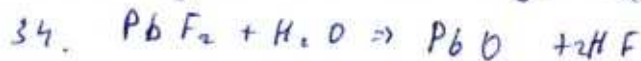
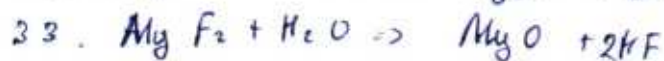
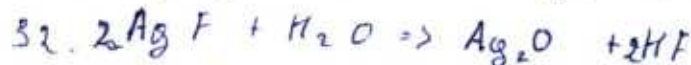
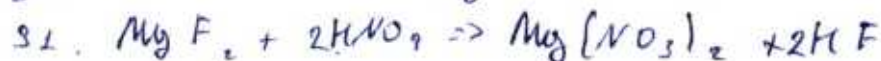
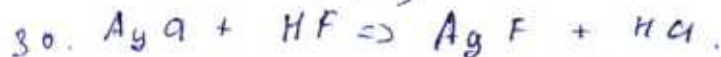
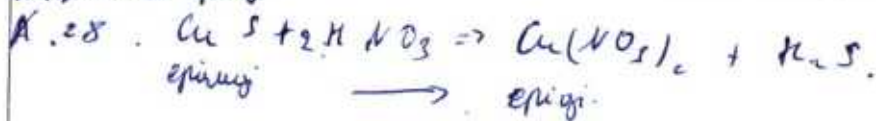
А3. Төзетін бөліктері:



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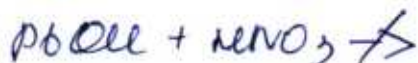
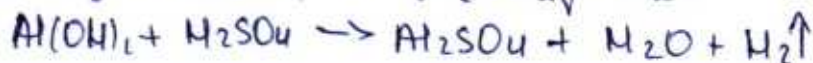
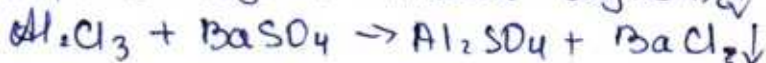
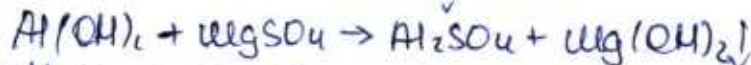
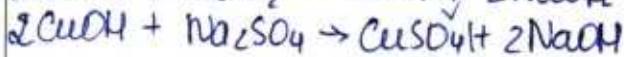
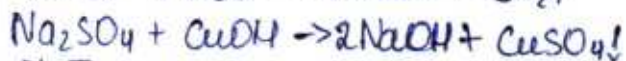
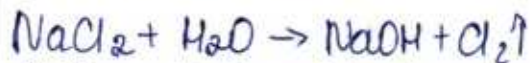


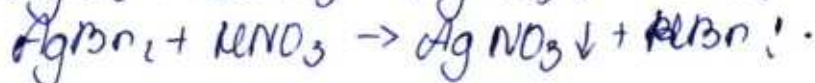
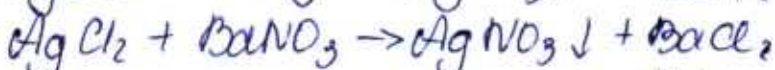
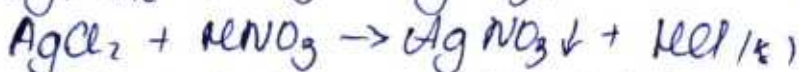
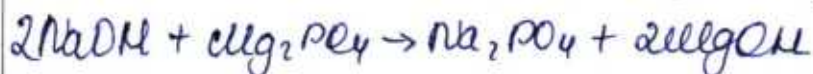
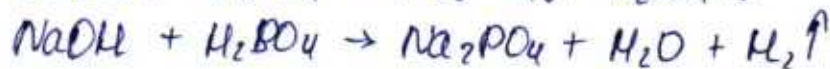
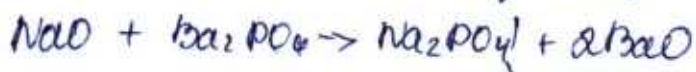
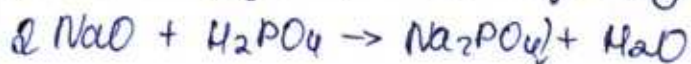
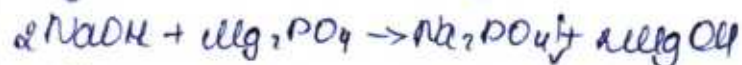
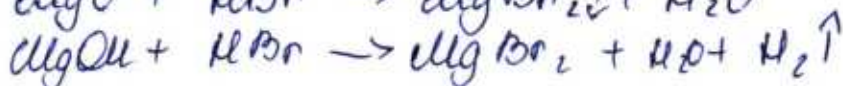
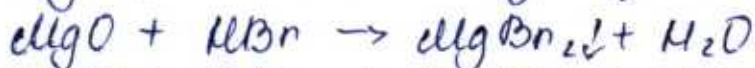
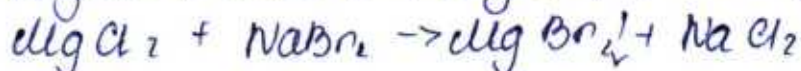
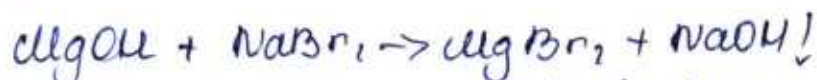
Атқабалт еріту.



Теориялық мотрица:
Брейли мен Гаурин
қосқан.

NaOH көңілдір тұнба

Al₂SO₄ ақ тұнбаCuSO₄ қызғылт тұнба (сұзғылт)Pb(NO₃)₂ (ақ - қызғылт)MgBr₂ ақNa₂PO₄ .Na₂SO₃ .AgNO₃ ақ тұнба



Берілгені :

NaOH , $\text{Al}_2(\text{SO}_4)_3$, CuSO_4 , $\text{Pb}(\text{NO}_3)_2$, MgBr_2 , Na_3PO_4 ,
 Na_2S , AgNO_3

NaOH - сарос , еригі

$\text{Al}_2(\text{SO}_4)_3$ - еригі

CuSO_4 - еригі

$\text{Pb}(\text{NO}_3)_2$ - еригі

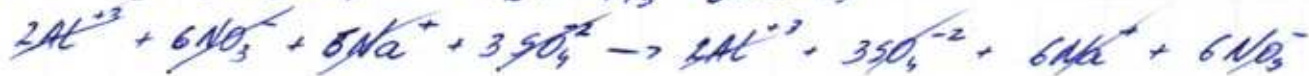
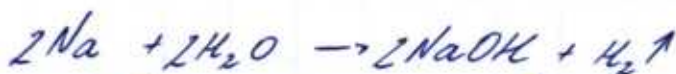
MgBr_2 - еригі

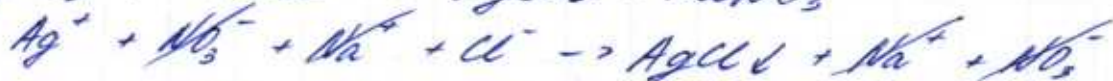
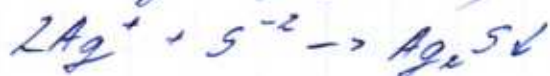
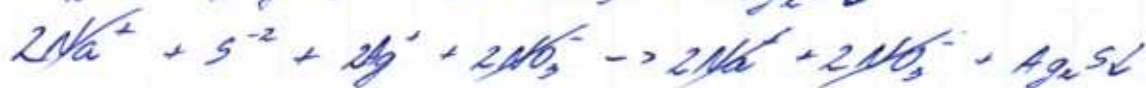
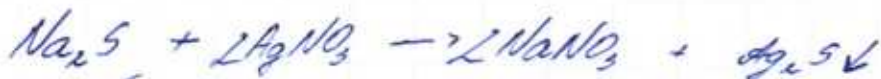
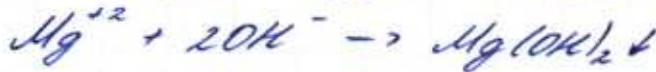
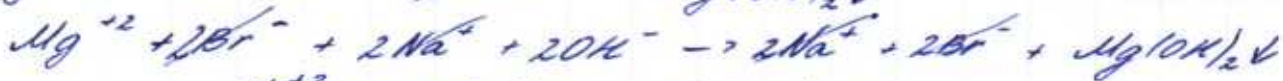
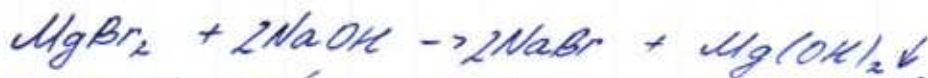
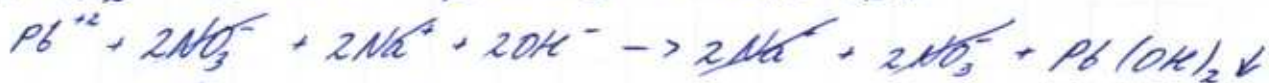
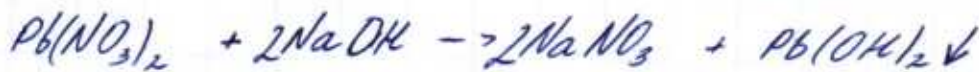
Na_3PO_4 - еригі

Na_2S - еригі

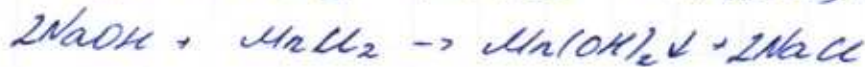
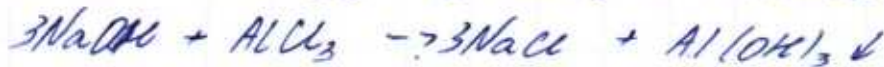
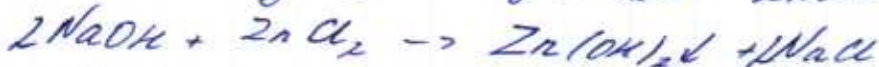
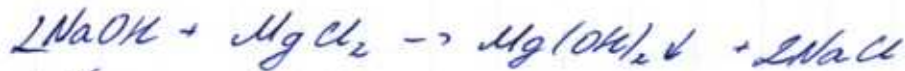
AgNO_3 - еригі

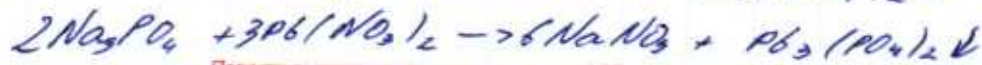
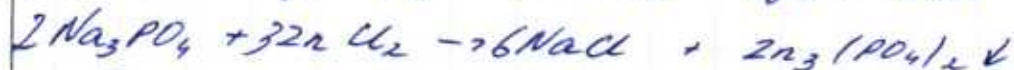
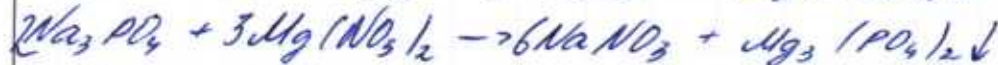
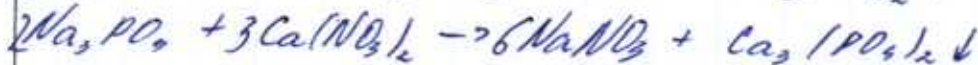
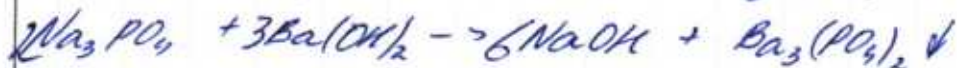
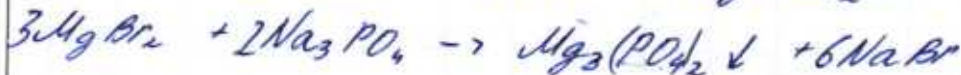
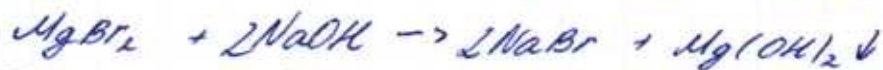
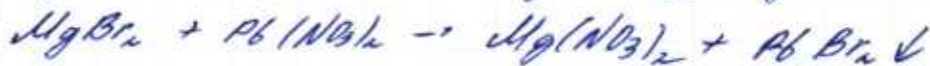
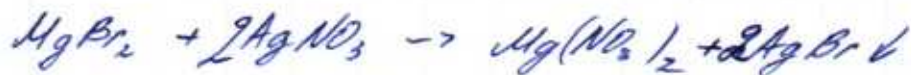
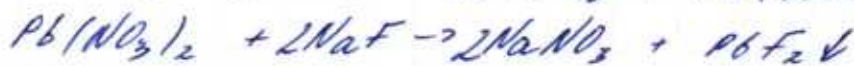
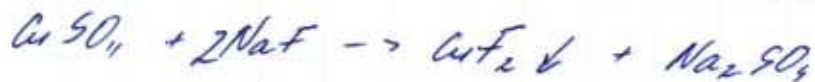
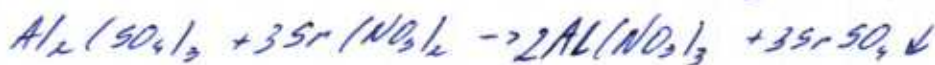
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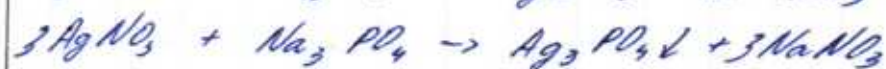
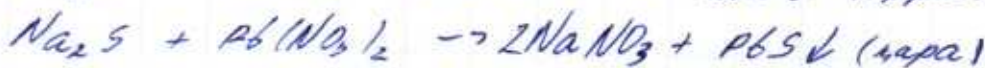
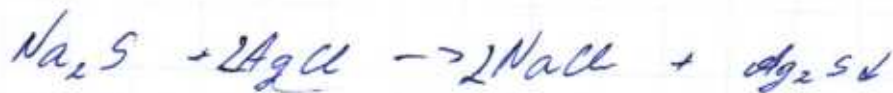
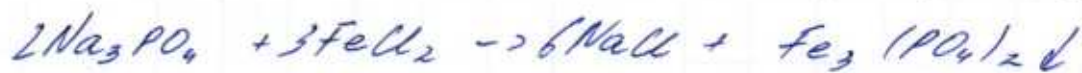


46 реакция:

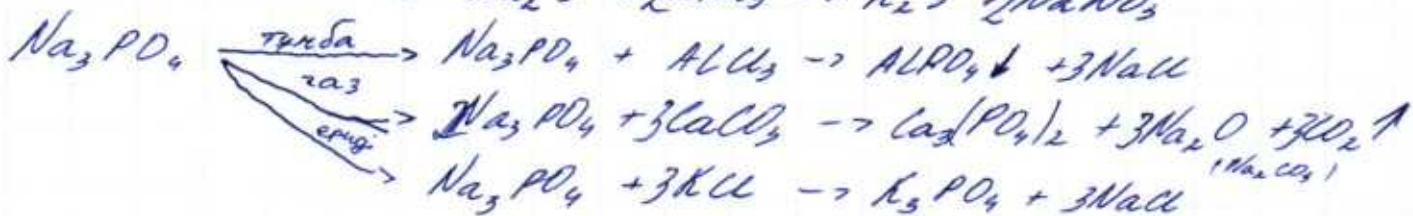
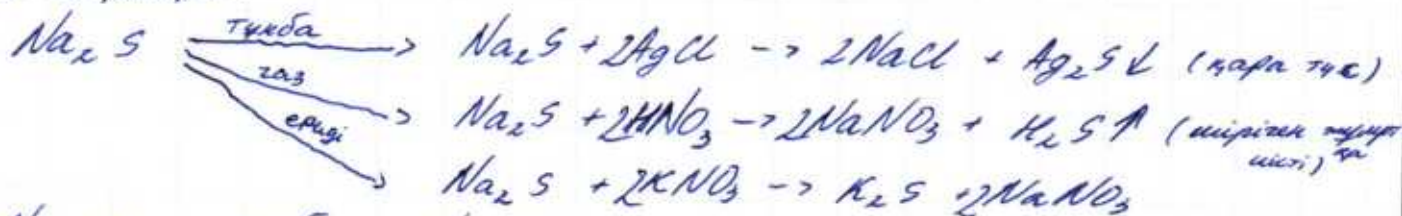


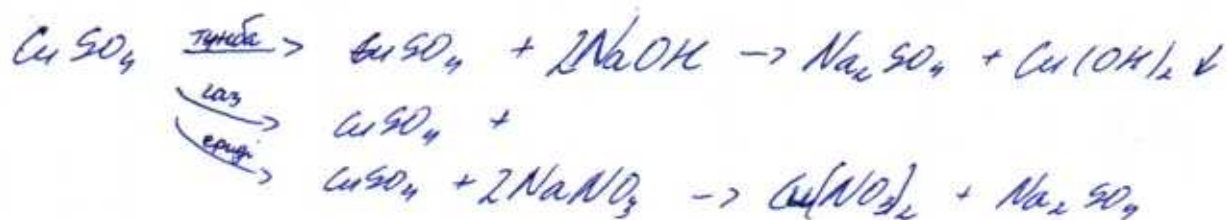
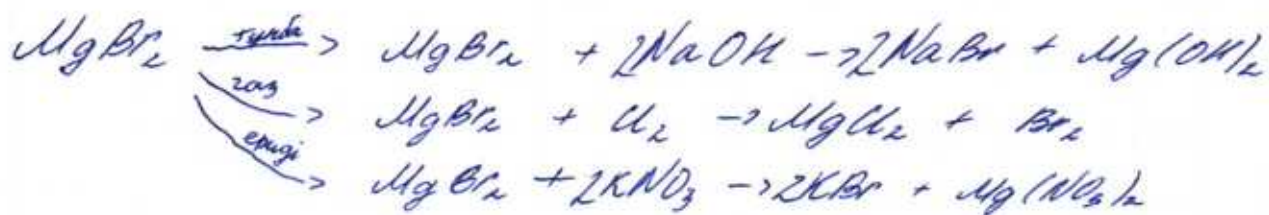
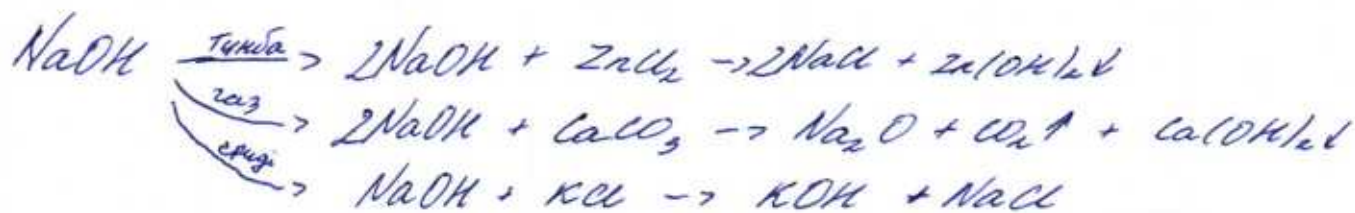
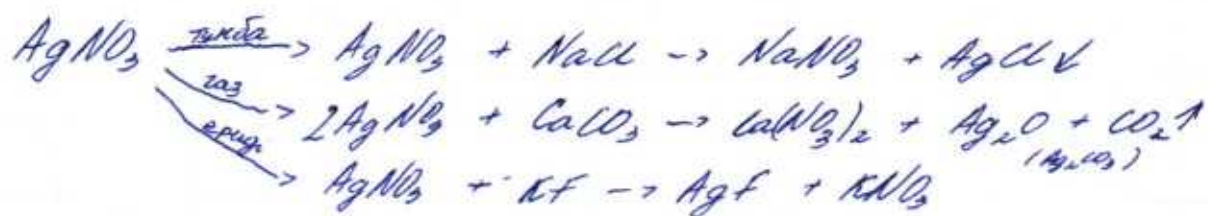


Парақтың артқы жағын толтырмаңыз / Обратную сторону листа не заполнять

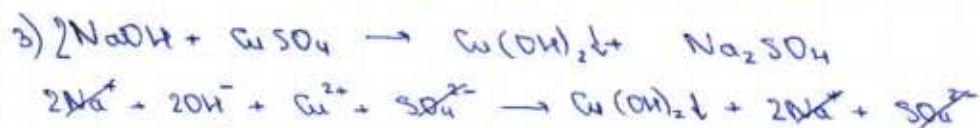
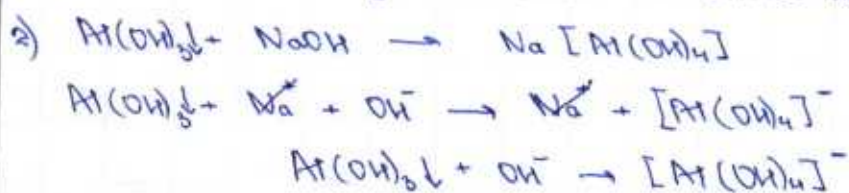
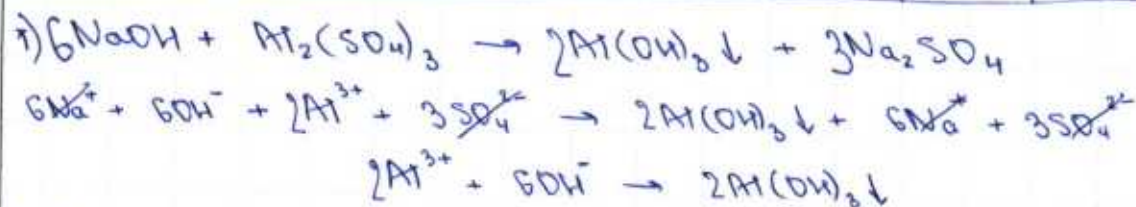


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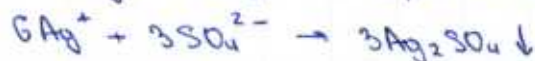
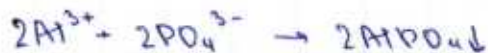
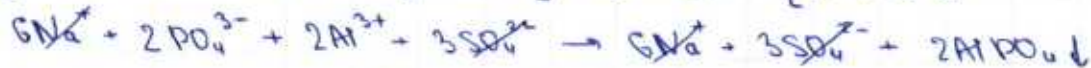
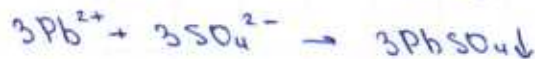
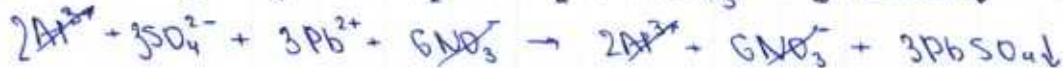
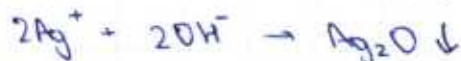
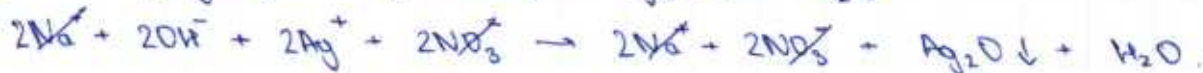
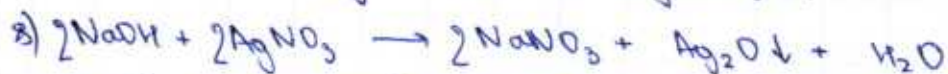
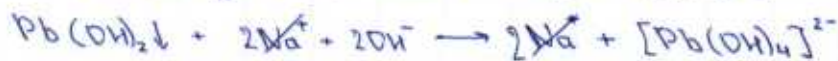
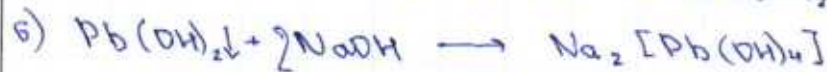
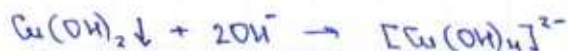
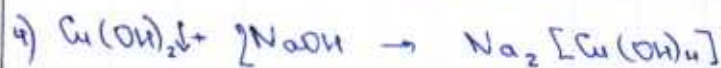


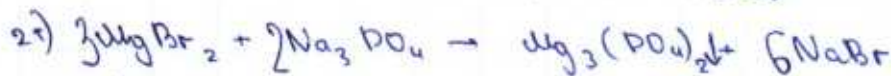
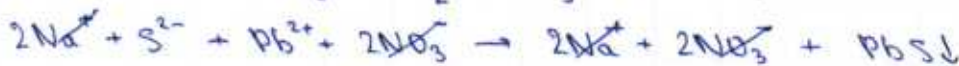
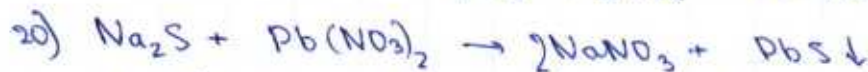
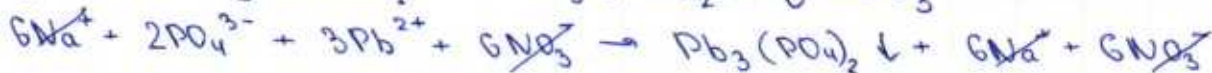
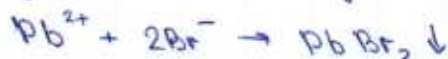
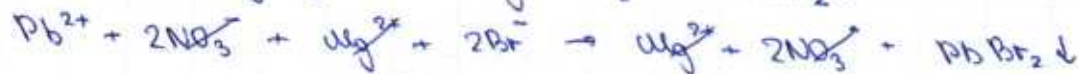
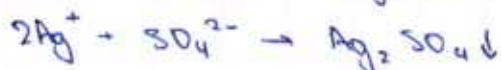
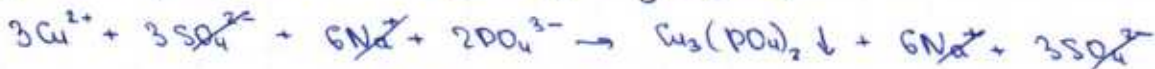
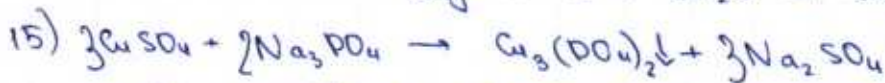
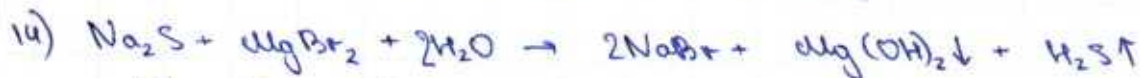
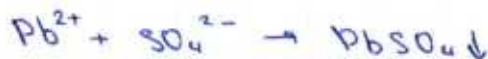


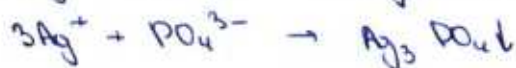
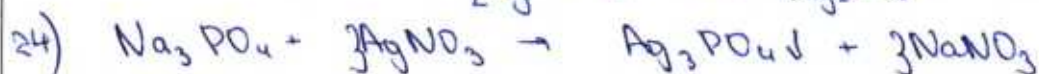
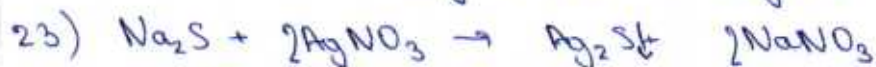
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NaOH	X	Al(OH) ₃ ↓ ағы [Al(OH) ₄] ⁻	Cu(OH) ₂ ↓ қара [Cu(OH) ₄] ²⁻	Pb(OH) ₂ ↓ ағы [Pb(OH) ₄] ²⁻	Mg(OH) ₂ ↓ ағы	X	X	Ag ₂ O↓ қара-қою	5↓(3↓ сұйық)
Al ₂ (SO ₄) ₃	Al(OH) ₃ ↓ [Al(OH) ₄] ⁻ ағы	X	X	PbSO ₄ ↓ ағы	—	AlPO ₄ ↓ ағы	Al(OH) ₃ ↓ ағы H ₂ S↑	Ag ₂ SO ₄ ↓ ағы	5↓(1↓ сұйық) 1↑
CuSO ₄	Cu(OH) ₂ ↓ қара [Cu(OH) ₄] ²⁻	X	X	PbSO ₄ ↓ ағы	—	Cu ₃ (PO ₄) ₂ ↓ қара-қою	CuS↓ қара	Ag ₂ SO ₄ ↓ ағы	5↓(1↓ сұйық)
Pb(NO ₃) ₂	Pb(OH) ₂ ↓ ағы [Pb(OH) ₄] ²⁻	PbSO ₄ ↓ ағы	PbSO ₄ ↓ ағы	X	PbBr ₂ ↓ ағы	Pb ₃ (PO ₄) ₂ ↓ ағы	PbS↓ қара	—	6↓(1↓ сұйық)
MgBr ₂	Mg(OH) ₂ ↓ ағы	—	—	PbBr ₂ ↓ ағы	X	Mg ₃ (PO ₄) ₂ ↓ ағы	Mg(OH) ₂ ↓ ағы H ₂ S↑	AgBr↓ қара	5↓ 1↑
Na ₃ PO ₄	X	AlPO ₄ ↓ ағы	Cu ₃ (PO ₄) ₂ ↓ қара-қою	Pb ₃ (PO ₄) ₂ ↓ ағы	Mg ₃ (PO ₄) ₂ ↓ ағы	X	X	Ag ₃ PO ₄ ↓ қара	5↓
Na ₂ S	X	Al(OH) ₃ ↓ ағы H ₂ S↑	CuS↓ қара	PbS↓ қара	Mg(OH) ₂ ↓ ағы H ₂ S↑	X	X	Ag ₂ S↓ қара	5↓ 2↑
AgNO ₃	Ag ₂ O↓ қара-қою	Ag ₂ SO ₄ ↓ ағы	Ag ₂ SO ₄ ↓ ағы	—	AgBr↓ қара	Ag ₃ PO ₄ ↓ қара	Ag ₂ S↓ қара	X	6↓
Σ	5↓(3↓ сұйық)	5↓(1↓ сұйық) 1↑	5↓ (1↓ сұйық)	6↓(1↓ сұйық)	5↓ 1↑	5↓	5↓ 2↑	6↓	

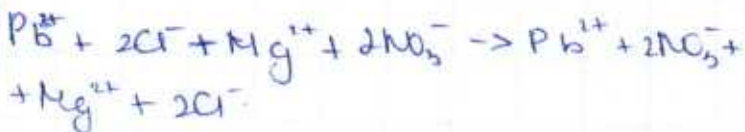
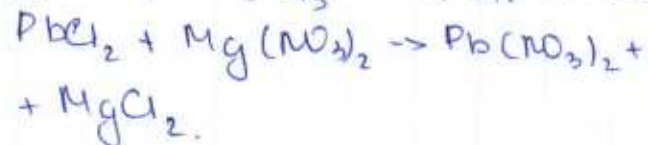
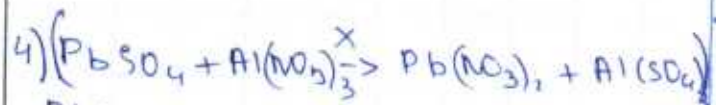
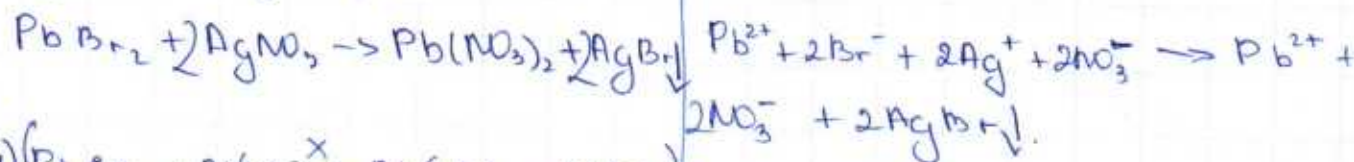
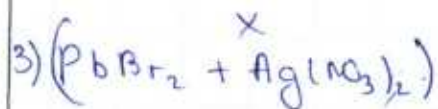
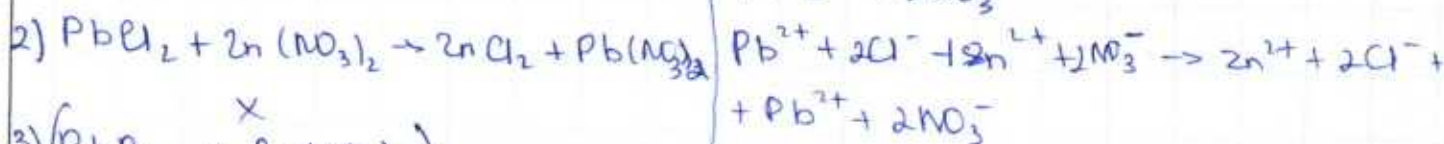
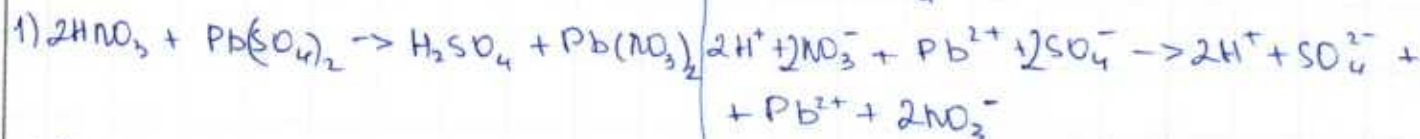
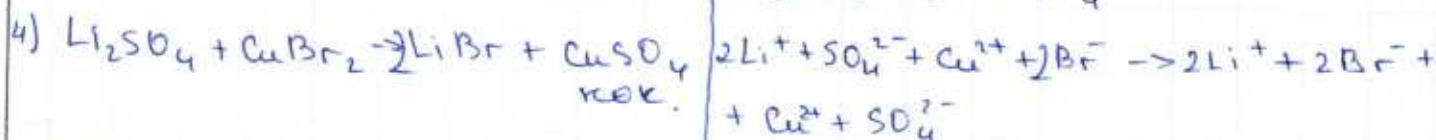
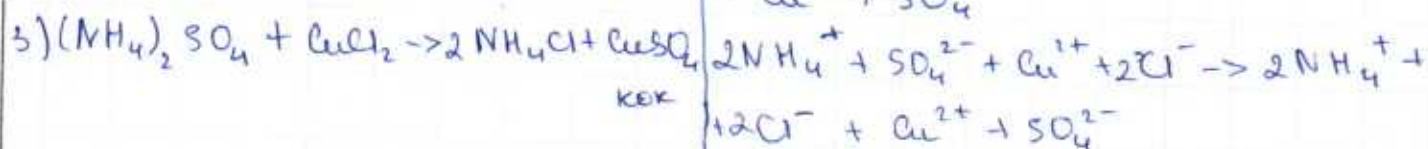
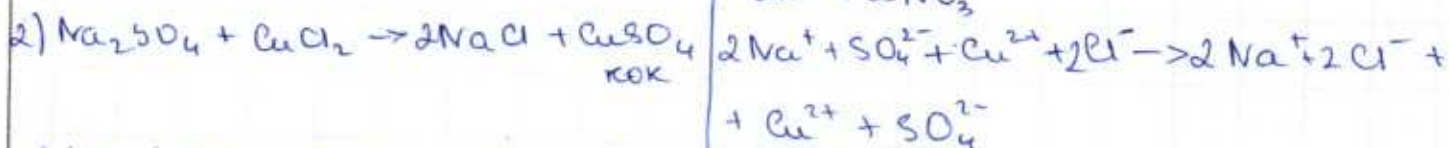
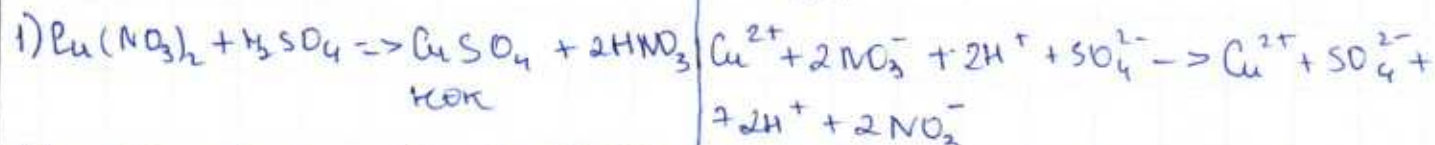
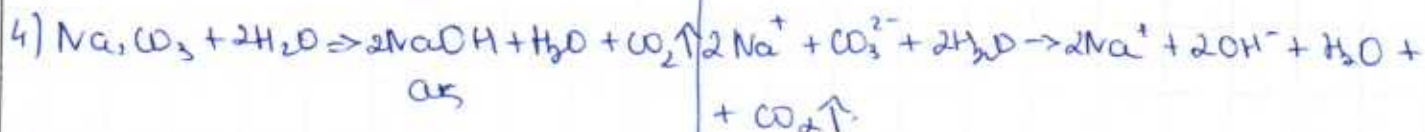
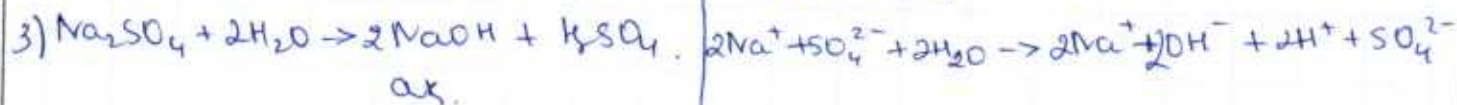
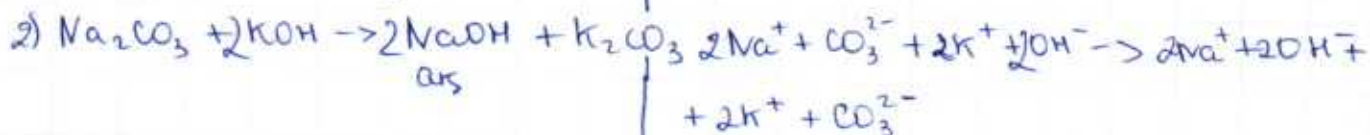
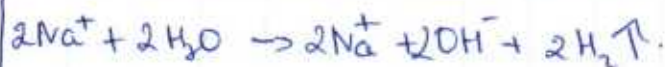
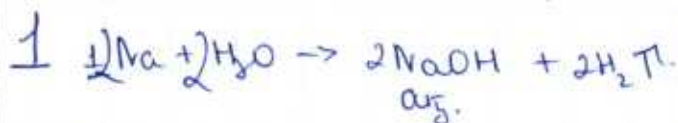


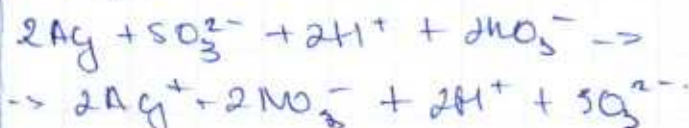
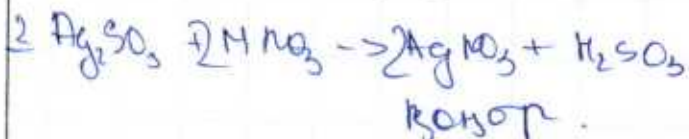
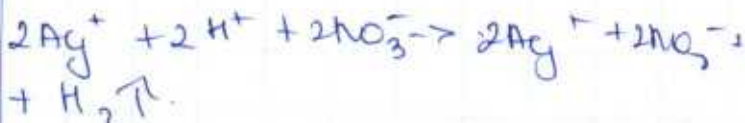
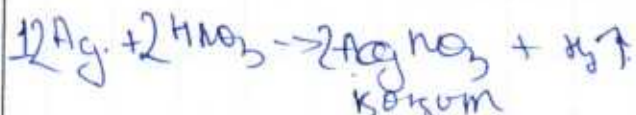
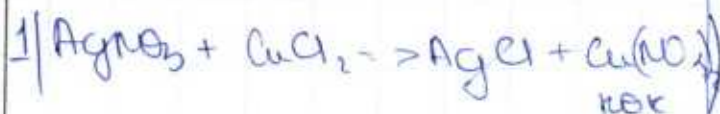
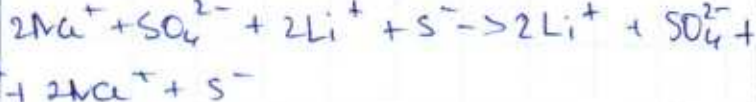
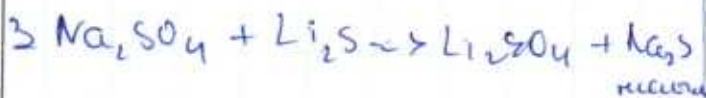
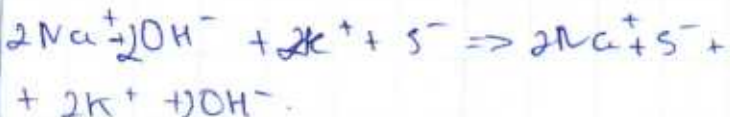
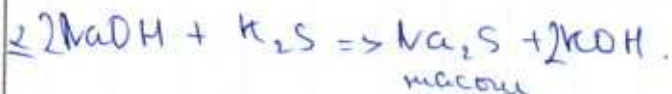
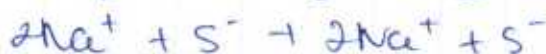
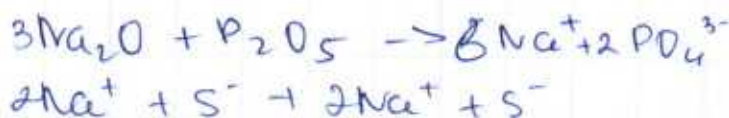
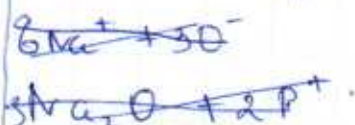
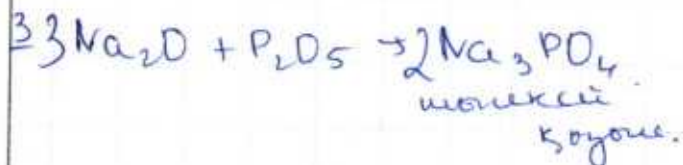
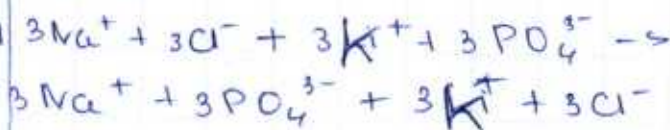
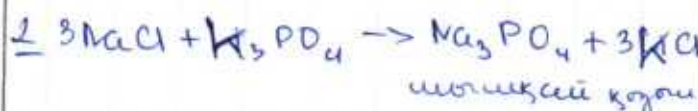
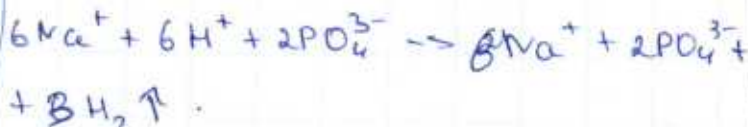
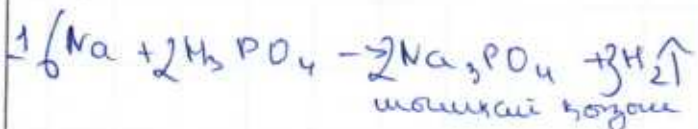
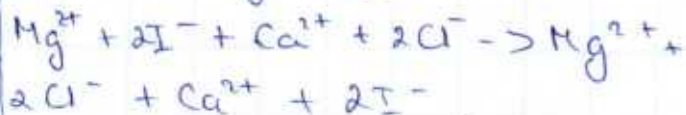
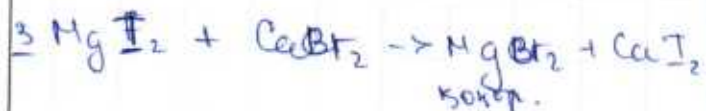
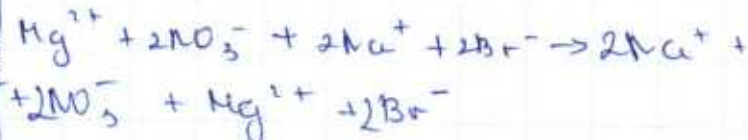
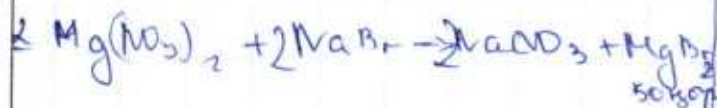
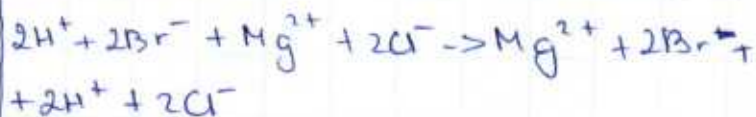
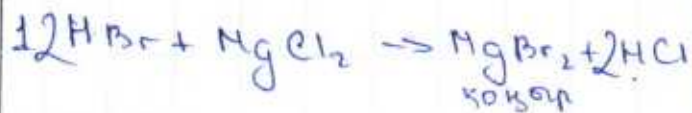
Парақтың артқы жағын толтырмаңыз / Обратную сторону листа не заполнять

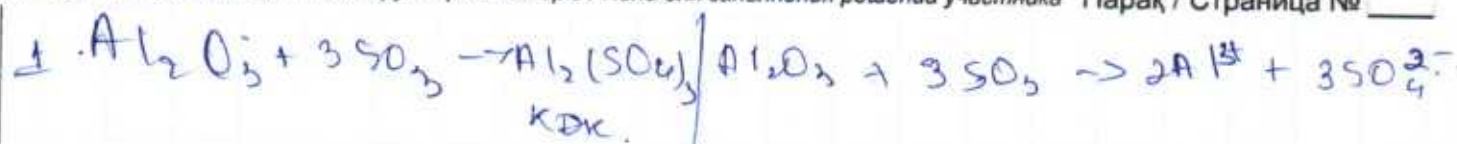




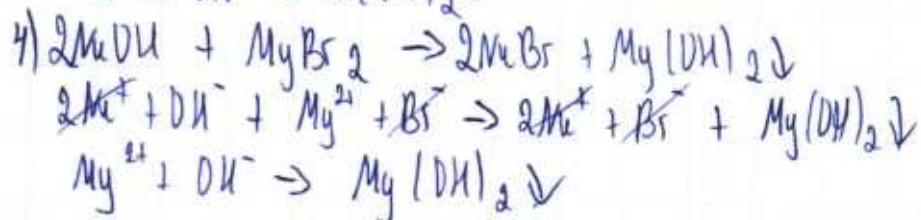
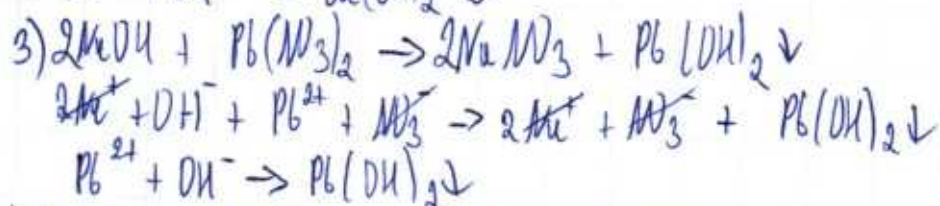
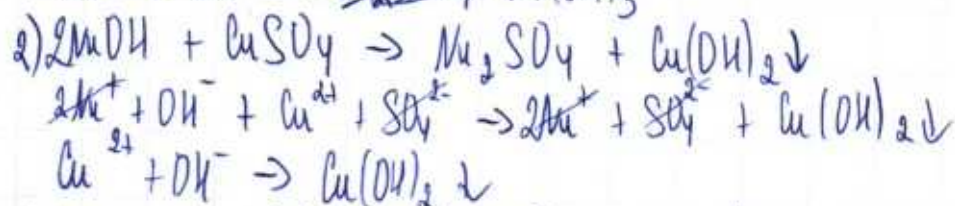
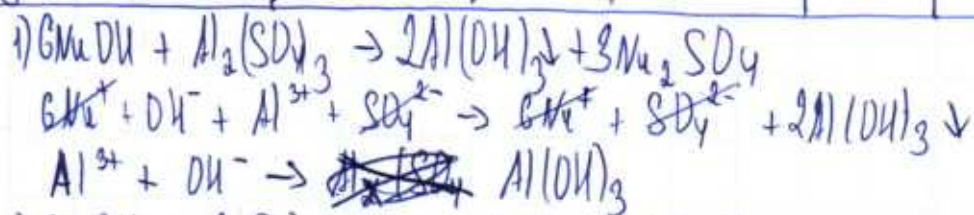


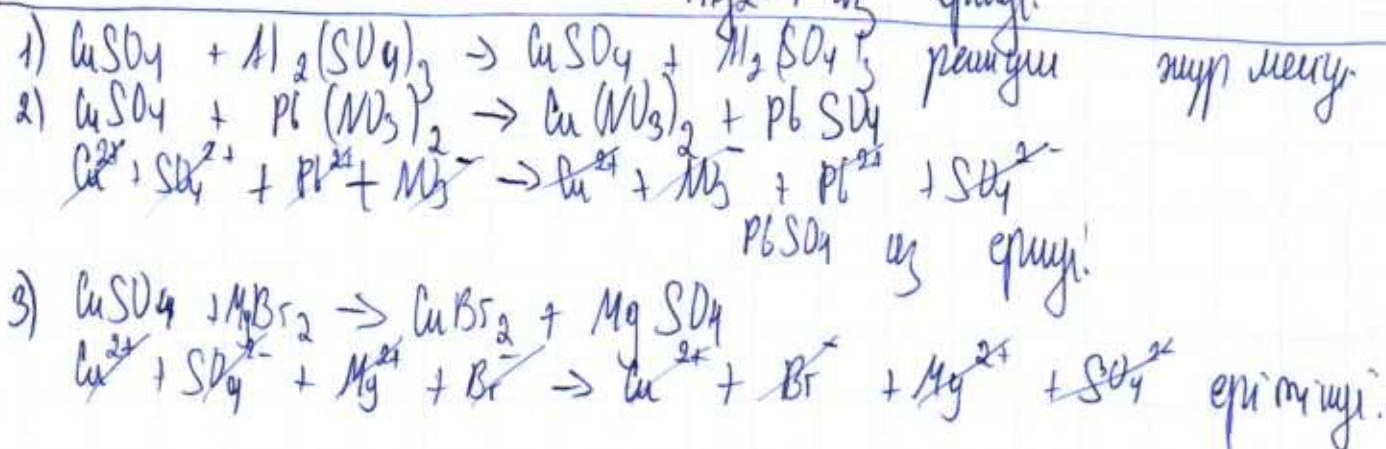
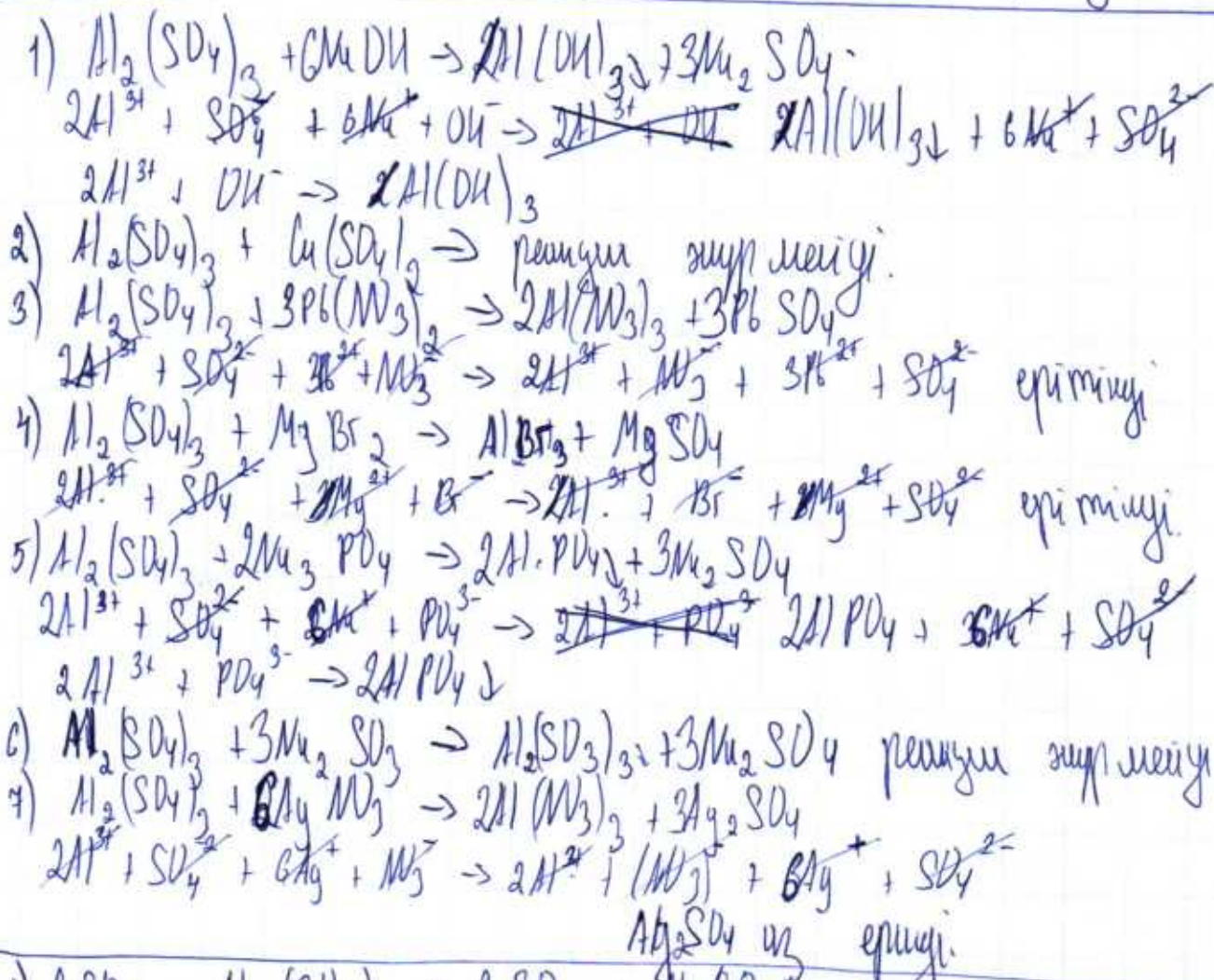
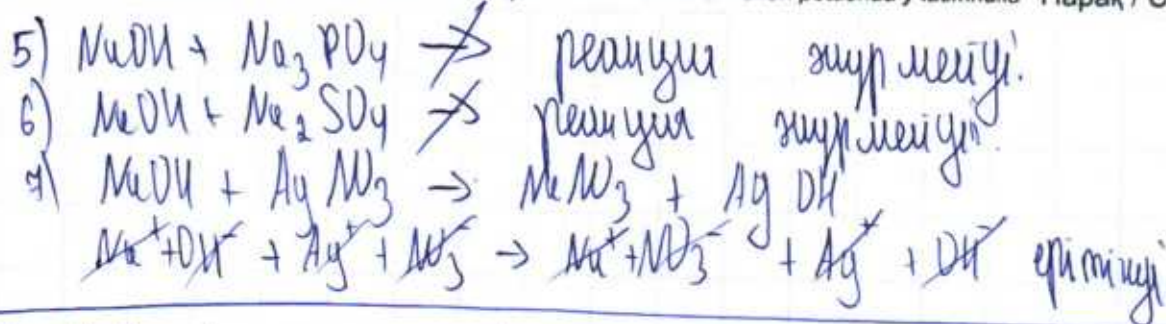


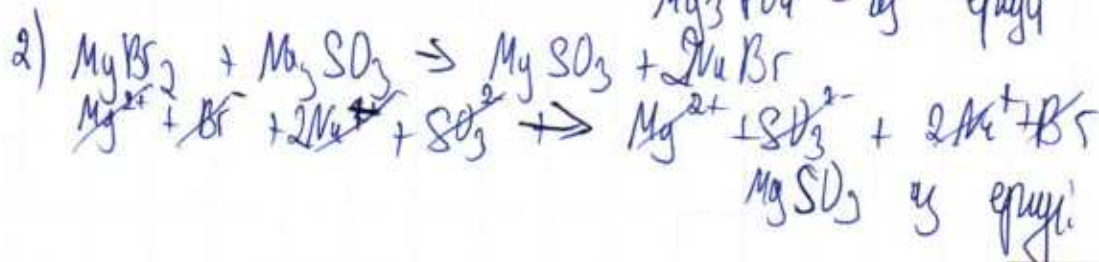
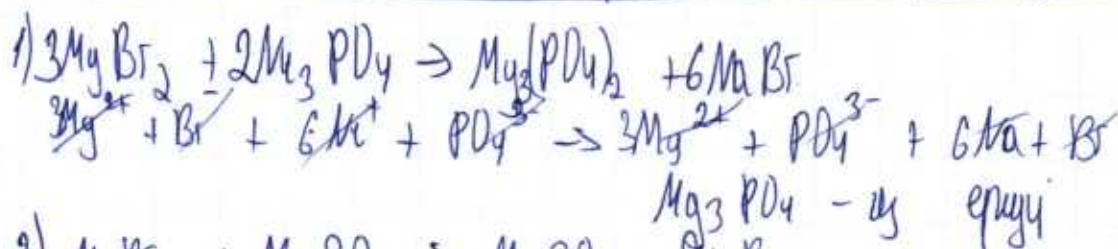
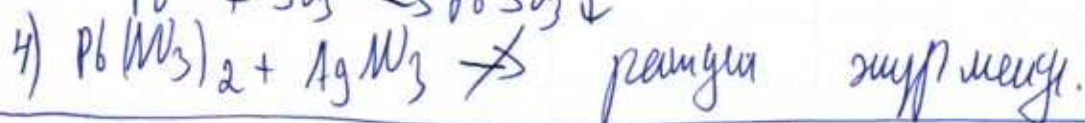
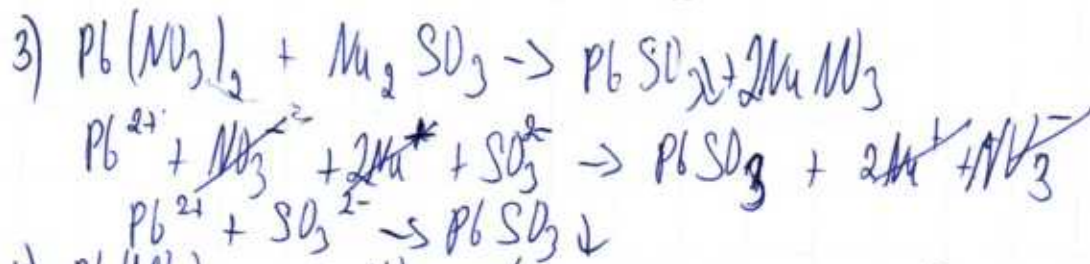
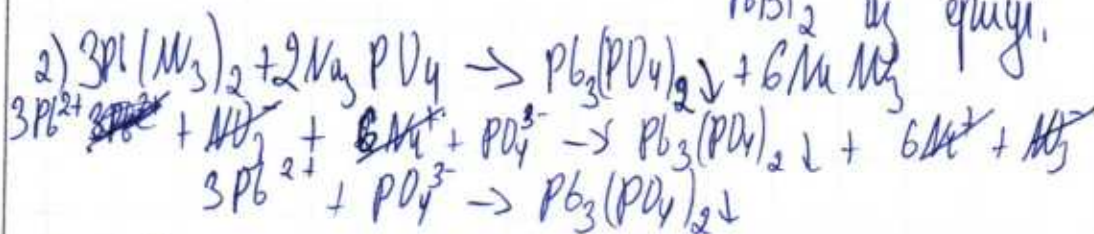
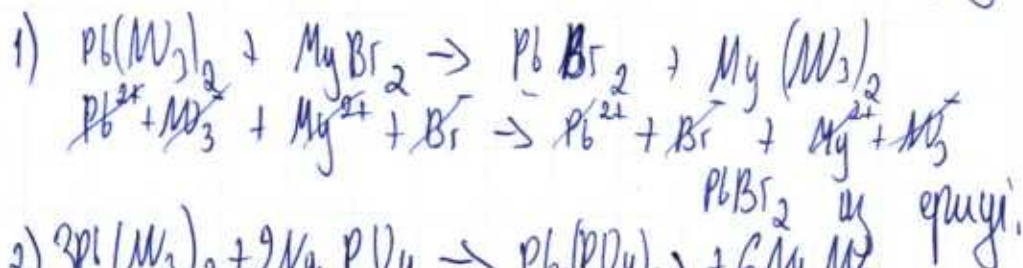
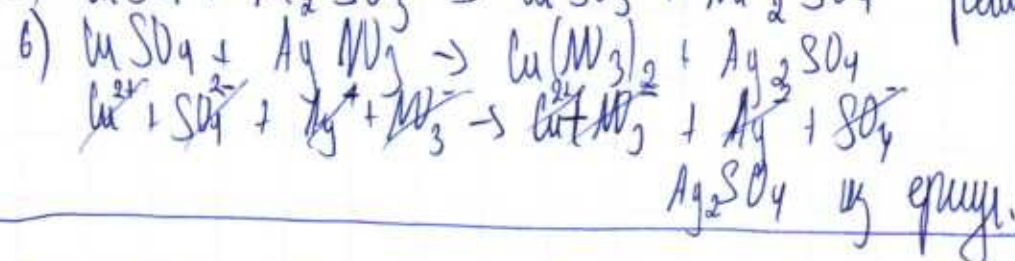
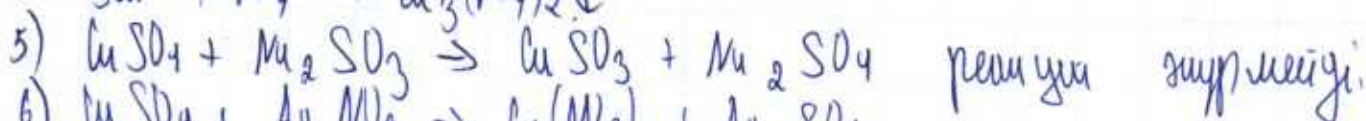
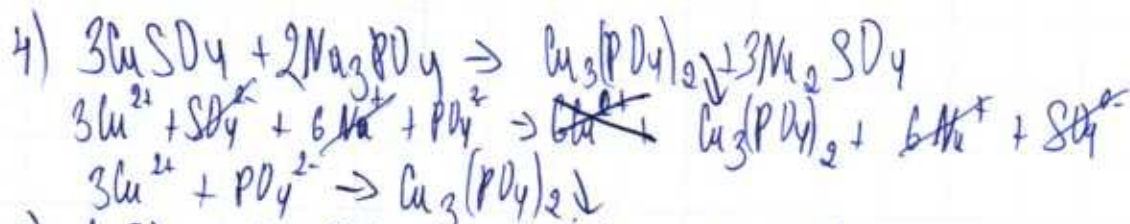


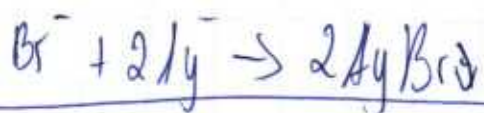
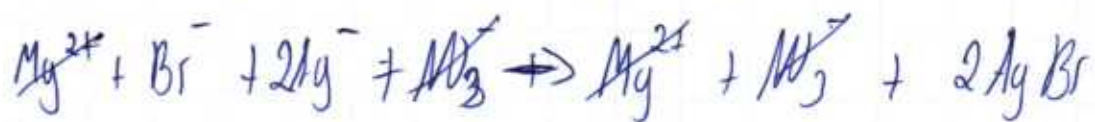
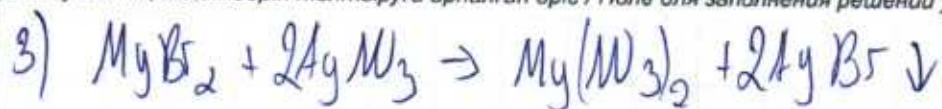


	NaOH	Al ₂ (SO ₄) ₃	CuSO ₄	Pb(NO ₃) ₂	MgBr ₂	Na ₃ PO ₄	Na ₂ SO ₃	AgNO ₃	W
NaOH	—	↓	↓	↓	↓	X	X	↓	↓↓↓
Al ₂ (SO ₄) ₃	↓	—	X	↓	↓	↓	—	↙	↓↓↓
CuSO ₄	↓	X	—	↙	↓	↓	—	↙	↓↓↓
Pb(NO ₃) ₂	↓	↓	↙	—	↙	↓	↓	—	↓↓↓
MgBr ₂	↓	↓	↓	↙	—	↙	↙	↓	↓↓↓
Na ₃ PO ₄	X	↓	↓	↓	↙	—	—	↓	↓↓↓
Na ₂ SO ₃	X	—	—	↓	↙	—	—	↙	↓
AgNO ₃	↓	↓	↙	—	↓	↓	↙	—	↓↓↓

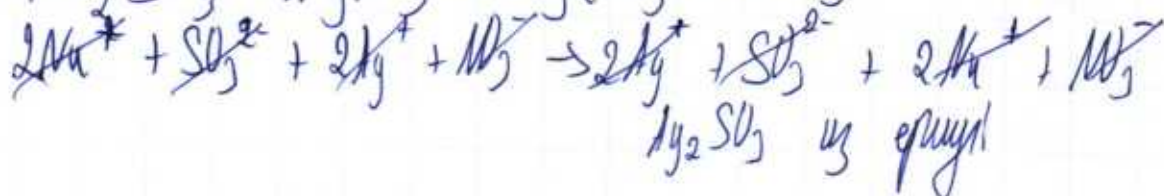
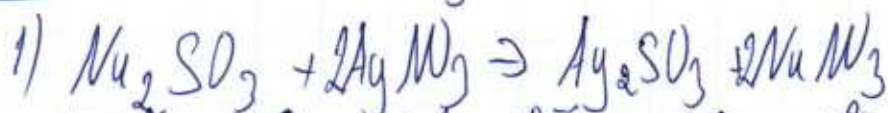
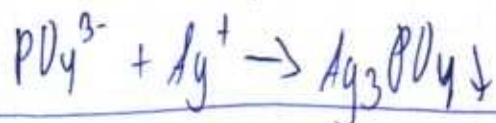
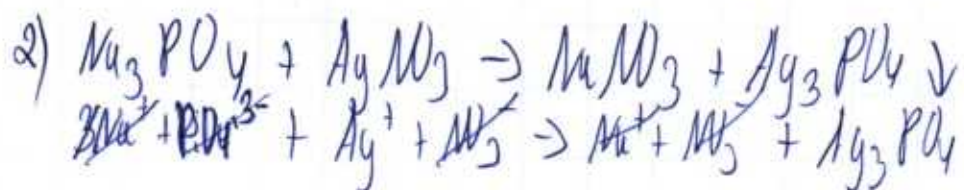




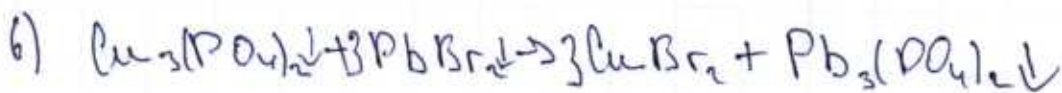
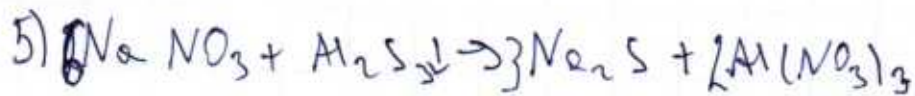
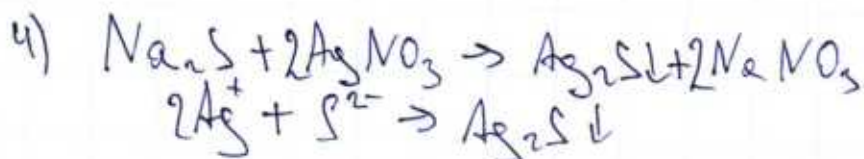
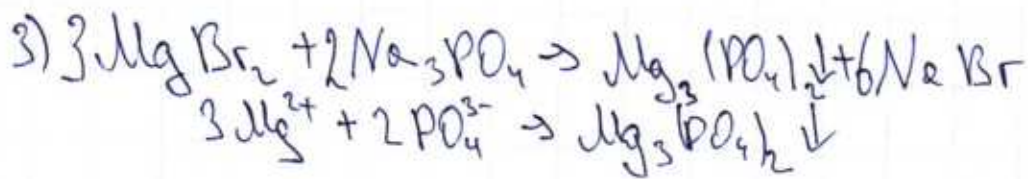
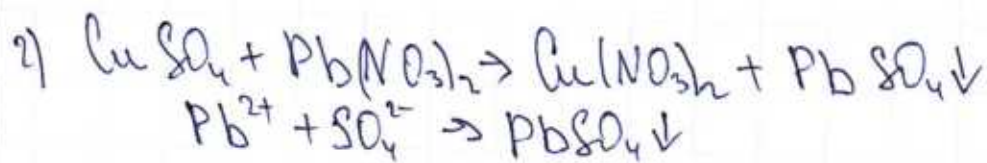
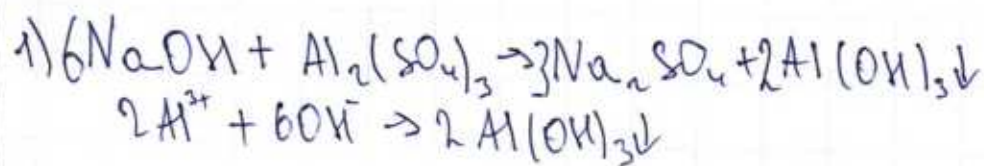


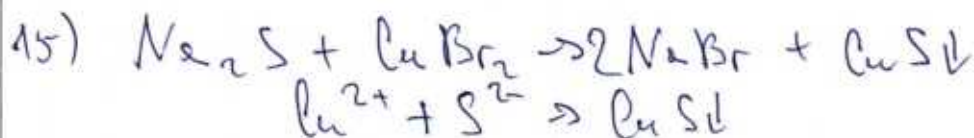
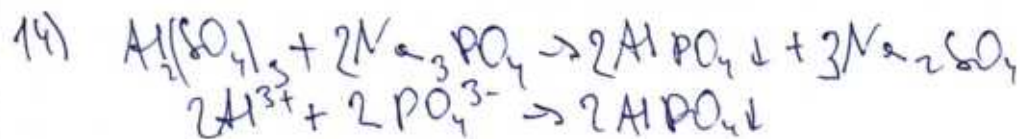
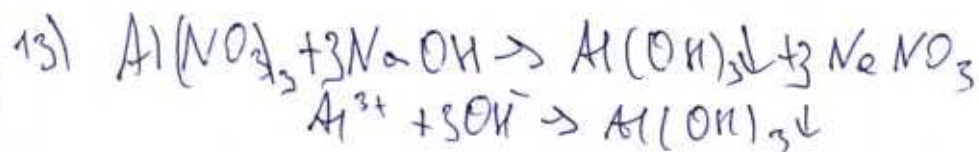
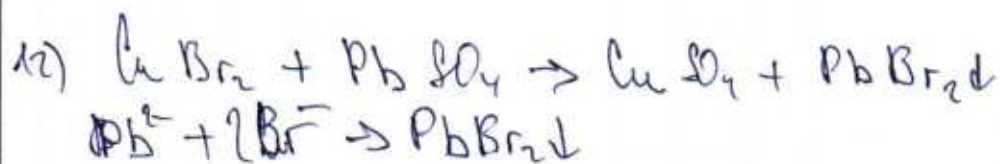
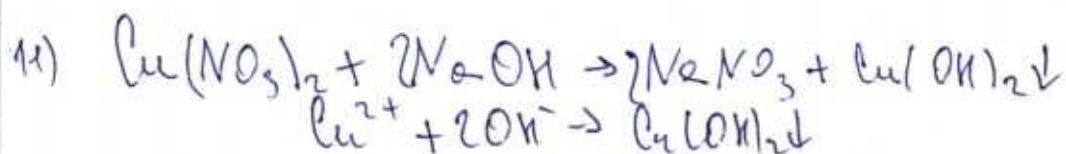
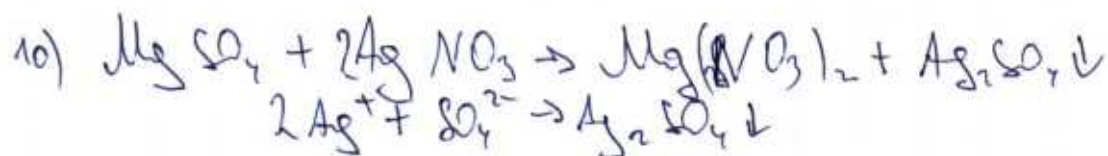
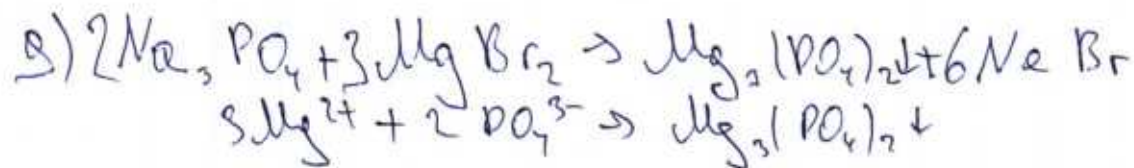
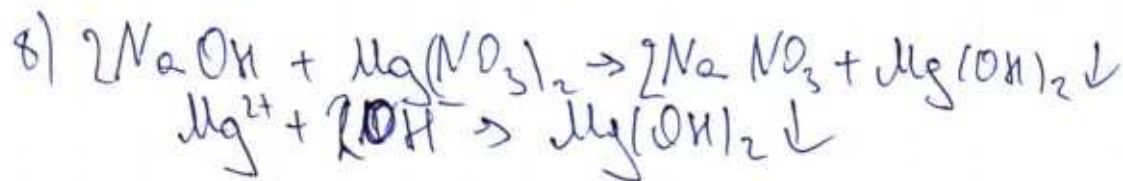
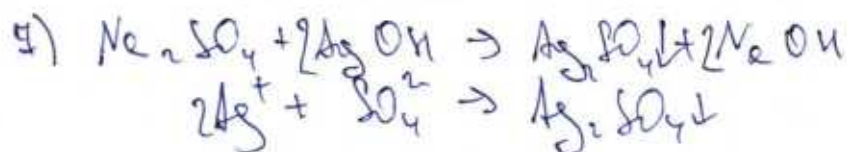


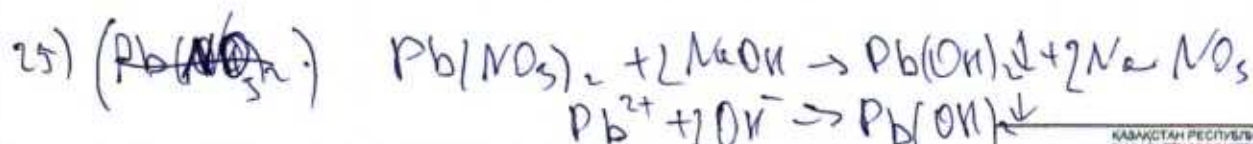
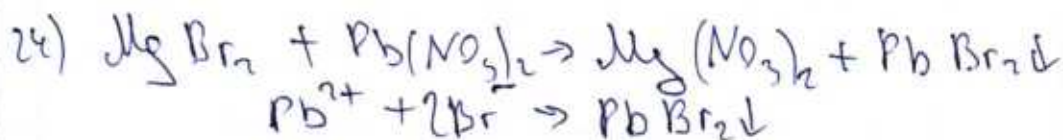
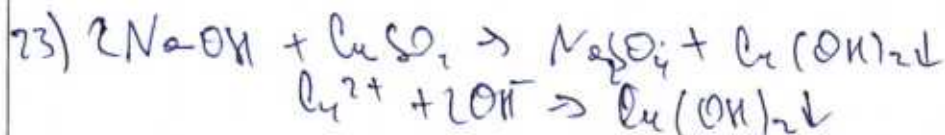
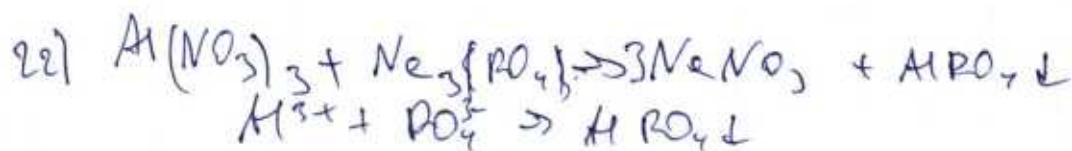
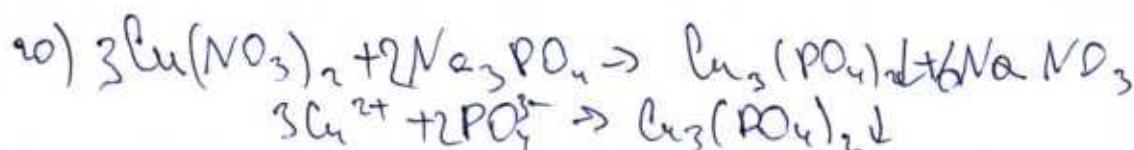
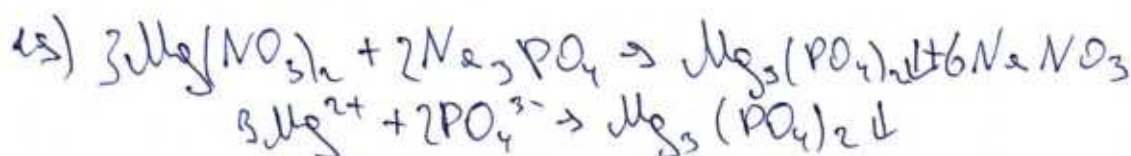
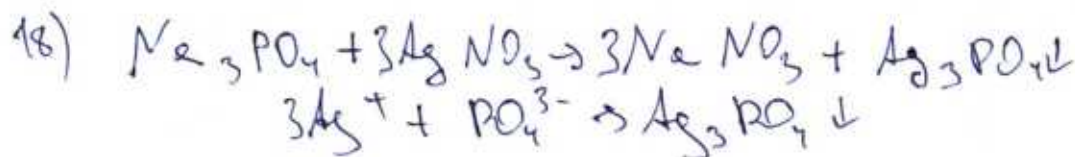
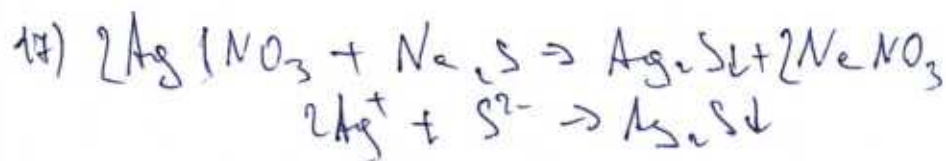
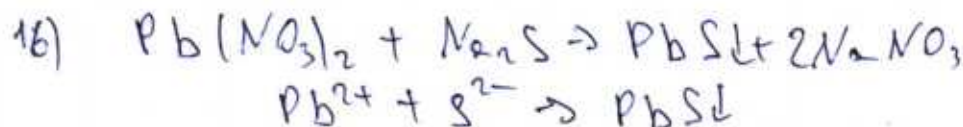
1) $Mg_3PO_4 + Na_2SO_3 \nrightarrow$ реакция жүрмейді.



	Na^+	Al^{3+}	Cu^{2+}	Pb^{2+}	Mg^{2+}	Na^+	Na^+	Ag^+
OH^-	NaOH	Al(OH)_3	Cu(OH)_2	Pb(OH)_2	Mg(OH)_2	NaOH	NaOH	AgOH
SO_4^{2-}	Na_2SO_4	$\text{Al}_2(\text{SO}_4)_3$	CuSO_4	PbSO_4	MgSO_4	Na_2SO_4	Na_2SO_4	Ag_2SO_4
SO_4^{2-}	Na_2SO_4	$\text{Al}_2(\text{SO}_4)_3$	CuSO_4	PbSO_4	MgSO_4	Na_2SO_4	Na_2SO_4	Ag_2SO_4
NO_3^-	NaNO_3	$\text{Al(NO}_3)_3$	$\text{Cu(NO}_3)_2$	$\text{Pb(NO}_3)_2$	$\text{Mg(NO}_3)_2$	NaNO_3	NaNO_3	AgNO_3
Br^-	NaBr	AlBr_3	CuBr_2	PbBr_2	MgBr_2	NaBr	NaBr	AgBr
PO_4^{3-}	Na_3PO_4	AlPO_4	$\text{Cu}_3(\text{PO}_4)_2$	$\text{Pb}_3(\text{PO}_4)_2$	$\text{Mg}_3(\text{PO}_4)_2$	Na_3PO_4	Na_3PO_4	Ag_3PO_4
S^{2-}	Na_2S	Al_2S_3	CuS	PbS	MgS	Na_2S	Na_2S	Ag_2S
NO_3^-	NaNO_3	$\text{Al(NO}_3)_3$	$\text{Cu(NO}_3)_2$	$\text{Pb(NO}_3)_2$	$\text{Mg(NO}_3)_2$	NaNO_3	NaNO_3	AgNO_3







$Al(OH)_3$ - ақ түзгіш түзілген түнде

$Cu(OH)_2$ - көк

CuS - қара

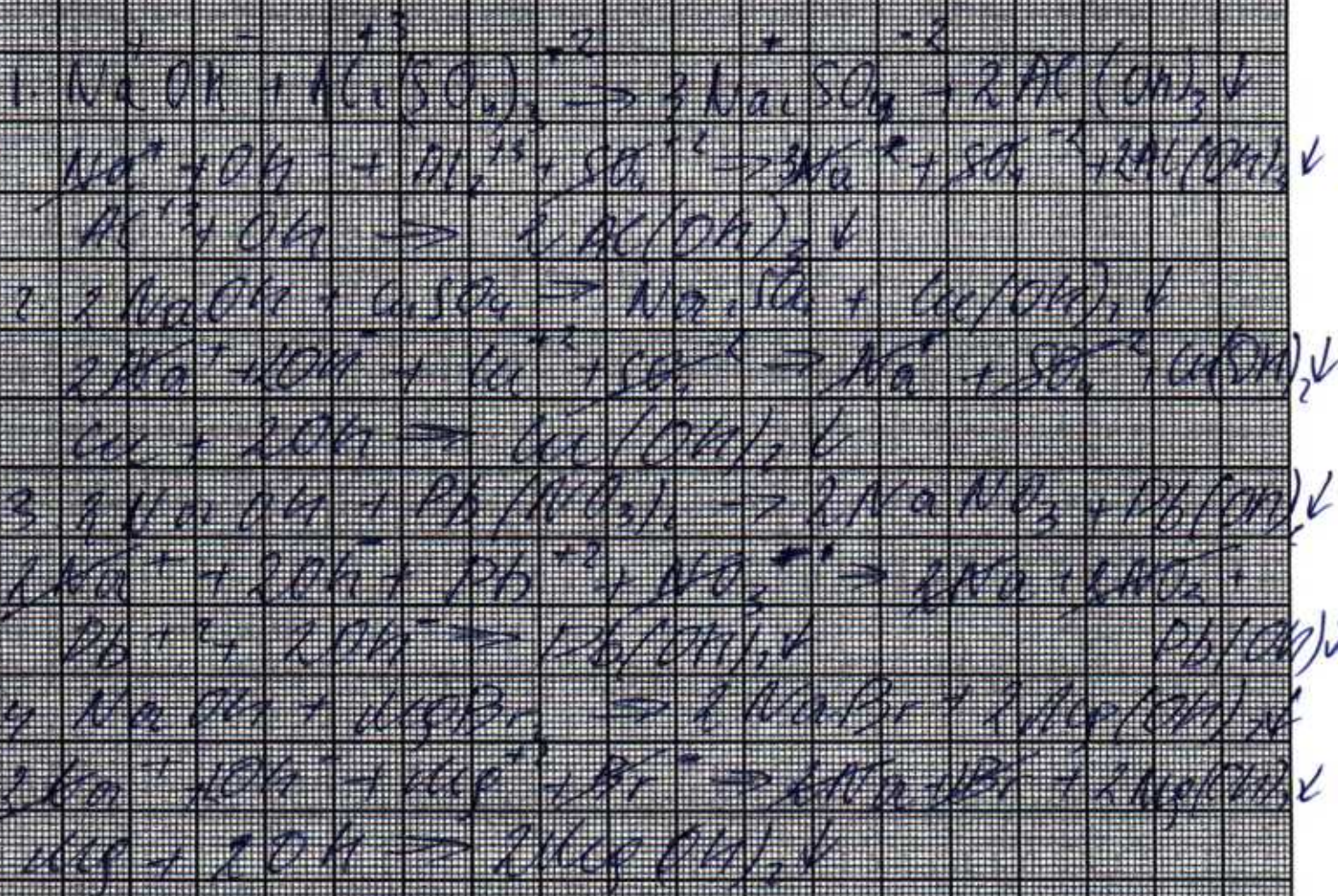
PbS - қара

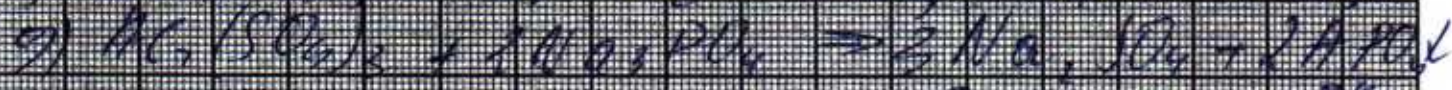
$CuSO_4$ - көк

Ag_2S - қара

$NaNO_3$ - ақ сәткір

	NaOH	Al(OH) ₃	CaSO ₄	Pb(NO ₃) ₂	HgBr ₂	NaNO ₃	Na ₂ S	AgNO ₃
NaOH	—	Al(OH) ₃ ↓	↓	↓	↓	—	↑	—
Al(OH) ₃	↓	—	—	↓	—	Al(OH) ₃ ↓	—	—
CaSO ₄	↓	↓	—	↓	—	↓	↓	—
Pb(NO ₃) ₂	↓	↓	↓	—	↓	↓	↓	—
HgBr ₂	↓	—	—	↓	—	—	—	AgBr ↓
NaNO ₃	—	↓	↓	↓	—	—	—	↓
Na ₂ S	—	↓	↓	↓	—	—	—	↓
AgNO ₃	↓	—	—	—	↓	↓	↓	—







Тапсырма

Берілгені K_2CO_3 , $AgNO_3$, $CaSO_4$, $Pb(NO_3)_2$, $HgBr_2$, Na_2CO_3 , Na_2SO_4 , $AgNO_3$

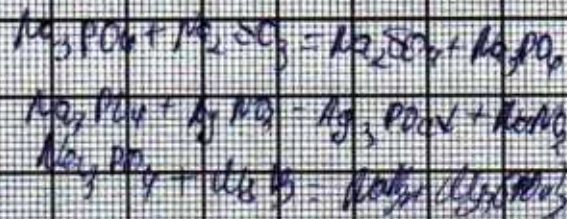
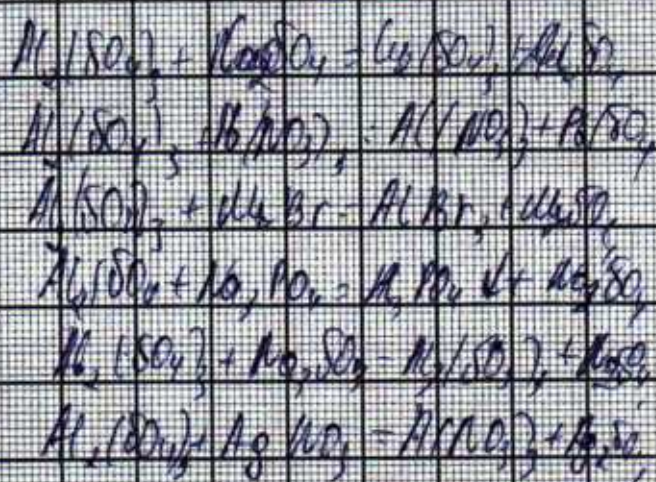
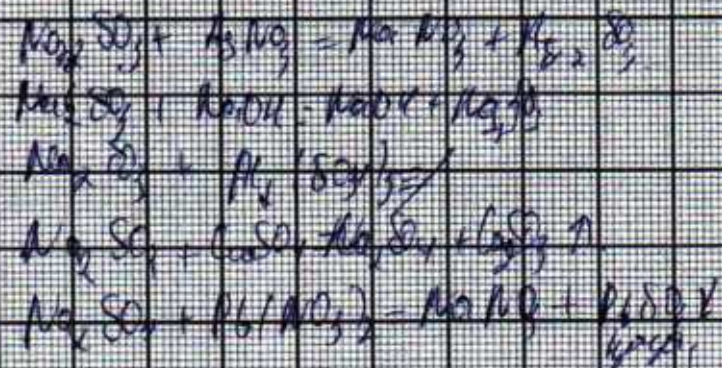
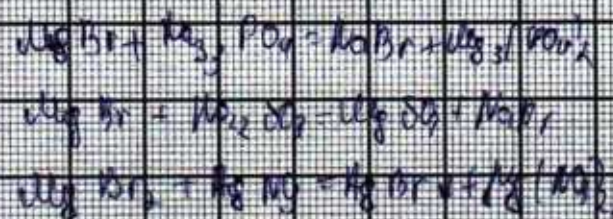
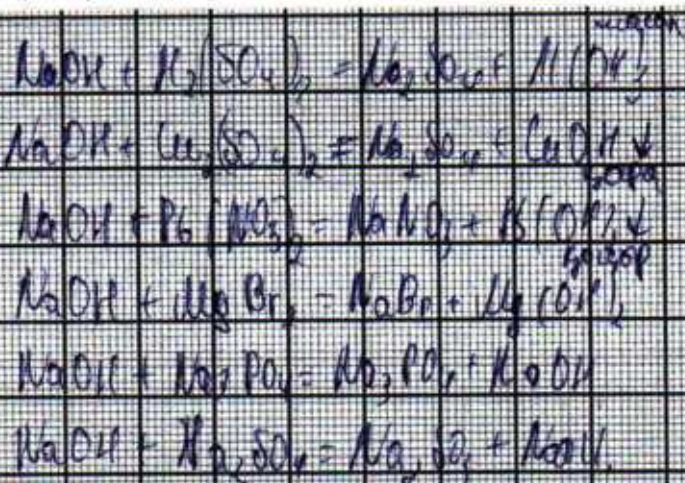
Түрбе тапсырма - 1

Түрбе тапсырма - 2

Түрбе тапсырма - 3

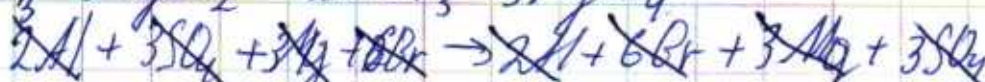
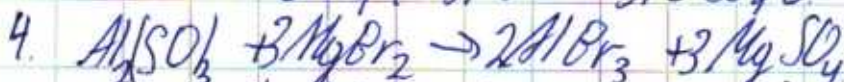
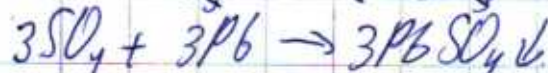
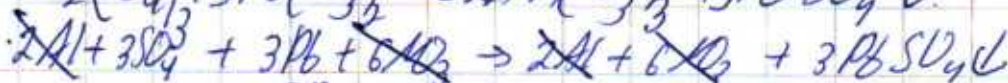
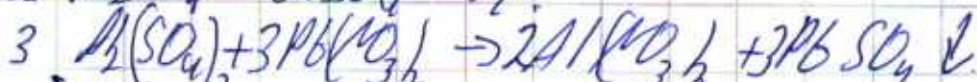
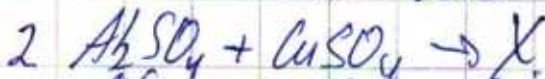
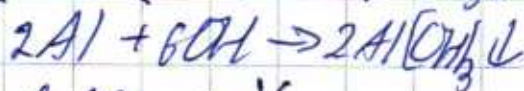
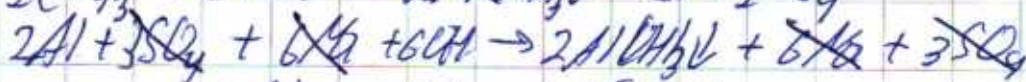
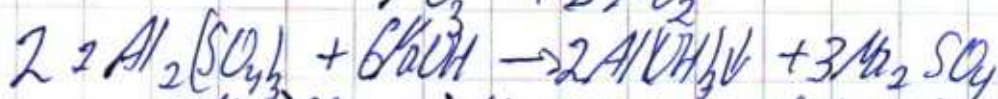
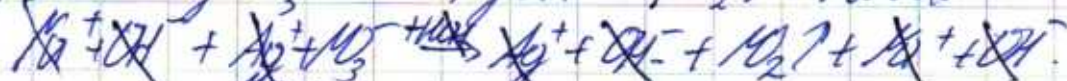
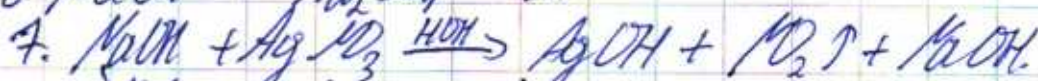
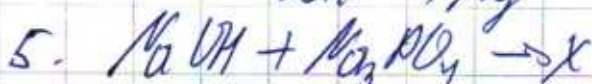
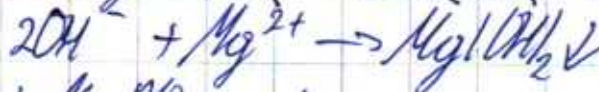
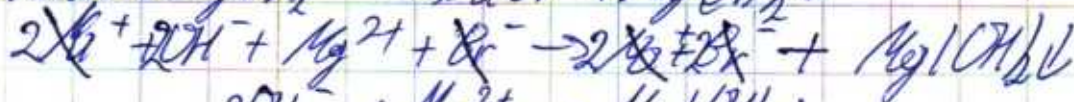
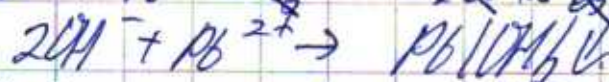
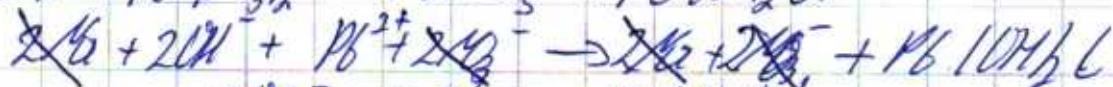
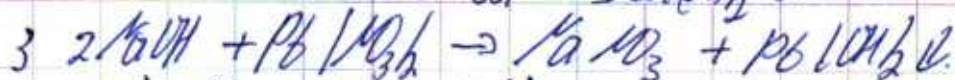
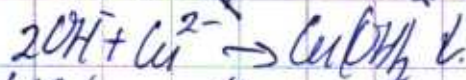
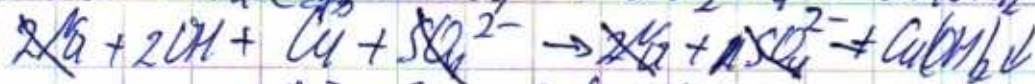
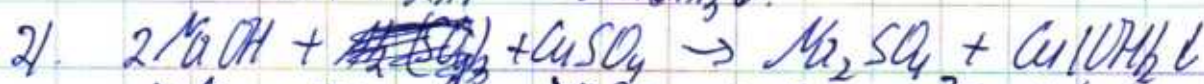
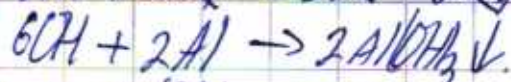
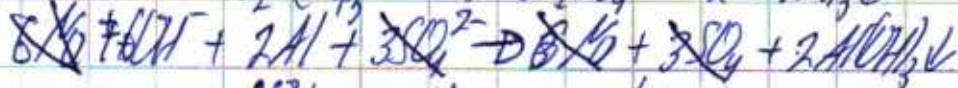
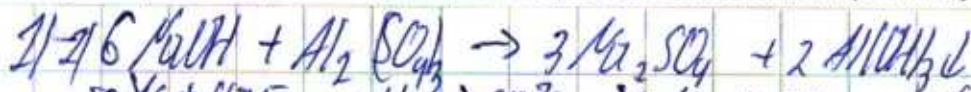
Түрбе тапсырма - 4

	K_2CO_3	$AgNO_3$	$CaSO_4$	$Pb(NO_3)_2$	$HgBr_2$	Na_2CO_3	Na_2SO_4	$AgNO_3$
K_2CO_3	—	K_2CO_3	$CaCO_3$	$PbCO_3$	Hg_2Br_2	Na_2CO_3	Na_2CO_3	—
$AgNO_3$	$AgNO_3$	—	Ag_2SO_4	Ag_2SO_4	Ag_2SO_4	$AgNO_3$	$AgNO_3$	—
$CaSO_4$	$CaSO_4$	$CaSO_4$	—	$CaSO_4$	$CaSO_4$	$CaSO_4$	$CaSO_4$	$CaSO_4$
$Pb(NO_3)_2$	$Pb(NO_3)_2$	$Pb(NO_3)_2$	$Pb(NO_3)_2$	—	$Pb(NO_3)_2$	$Pb(NO_3)_2$	$Pb(NO_3)_2$	$Pb(NO_3)_2$
$HgBr_2$	$HgBr_2$	$HgBr_2$	$HgBr_2$	$HgBr_2$	—	$HgBr_2$	$HgBr_2$	$HgBr_2$
Na_2CO_3	Na_2CO_3	Na_2CO_3	Na_2CO_3	Na_2CO_3	Na_2CO_3	—	Na_2CO_3	Na_2CO_3
Na_2SO_4	Na_2SO_4	Na_2SO_4	Na_2SO_4	Na_2SO_4	Na_2SO_4	Na_2SO_4	—	Na_2SO_4
$AgNO_3$	$AgNO_3$	$AgNO_3$	$AgNO_3$	$AgNO_3$	$AgNO_3$	$AgNO_3$	$AgNO_3$	—

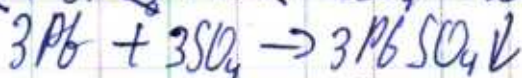
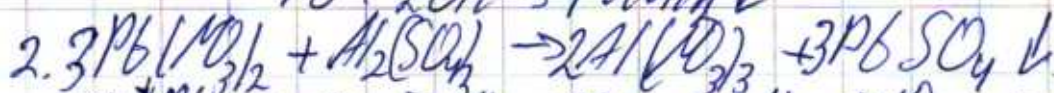
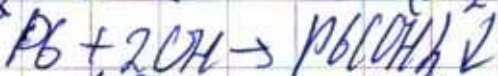
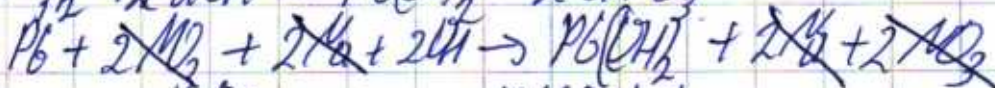
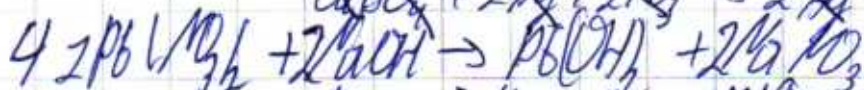
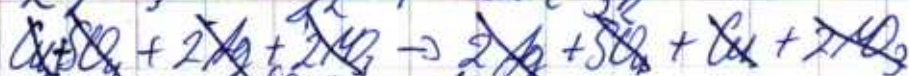
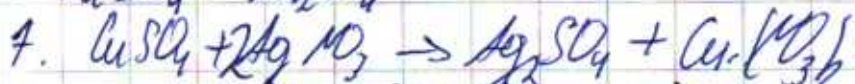
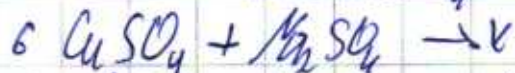
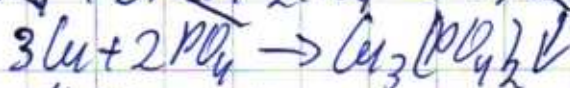
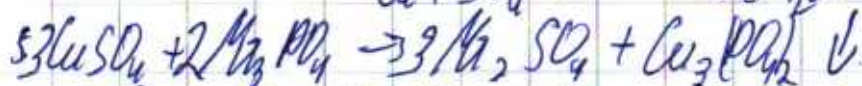
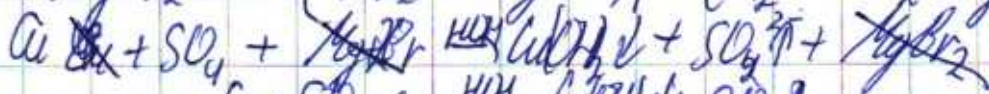
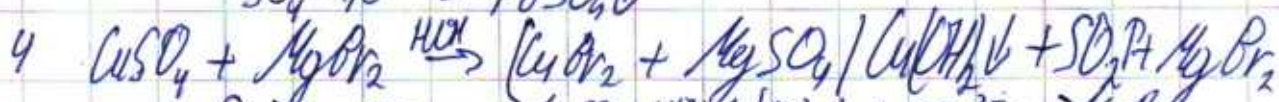
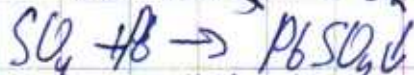
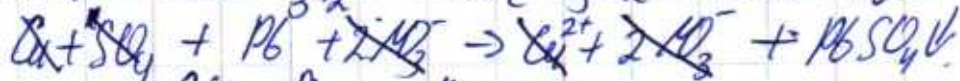
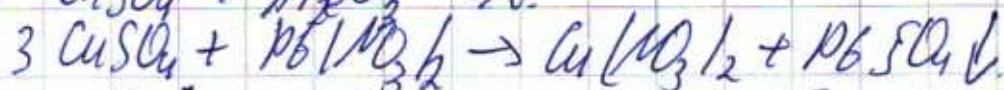
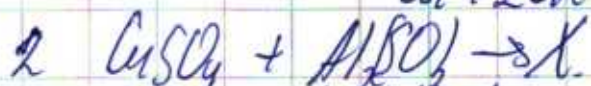
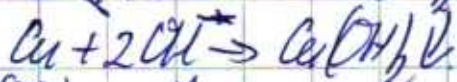
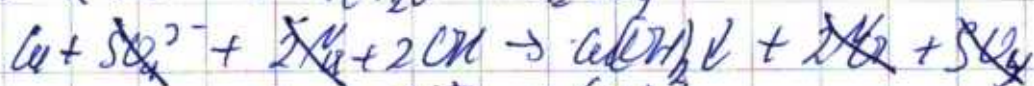
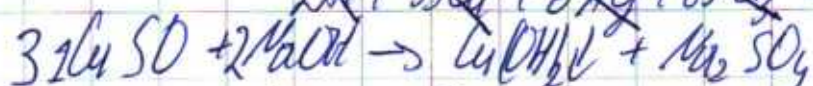
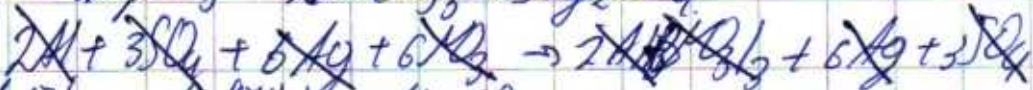
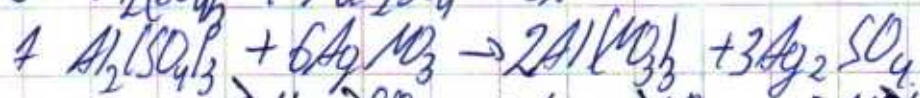
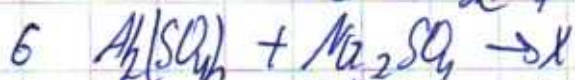
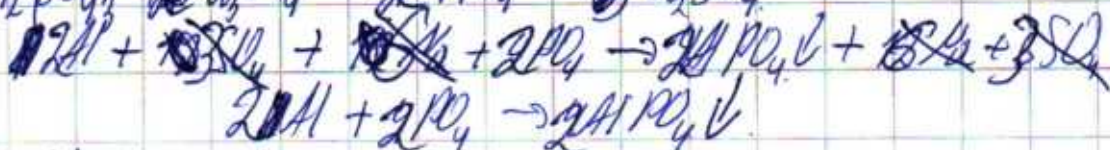
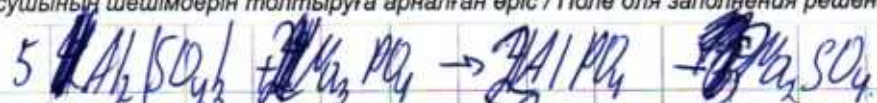


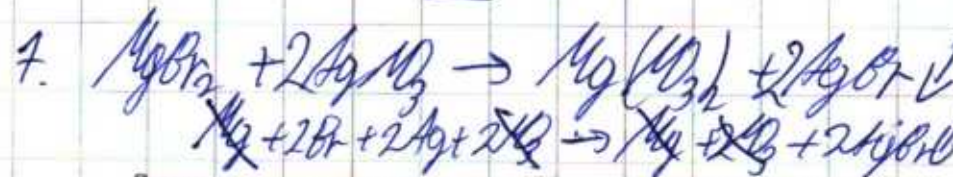
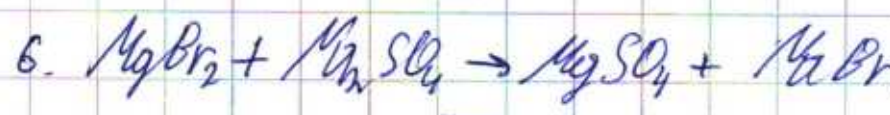
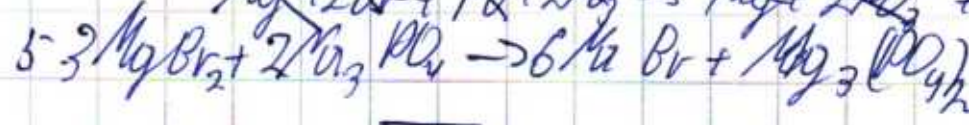
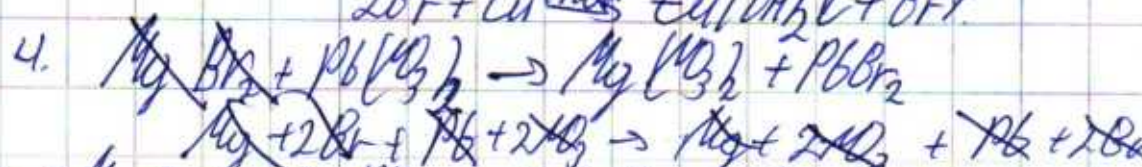
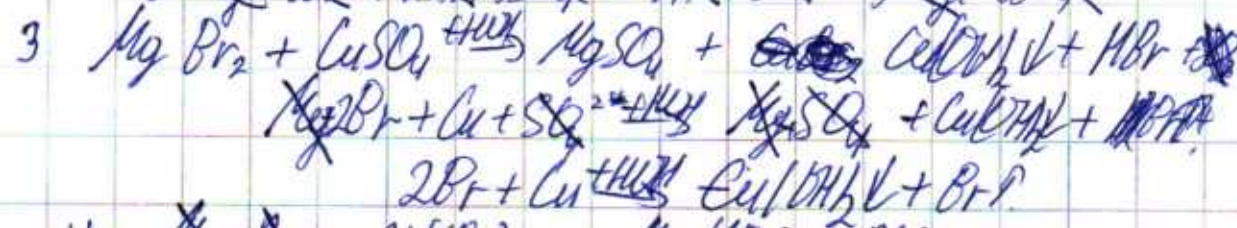
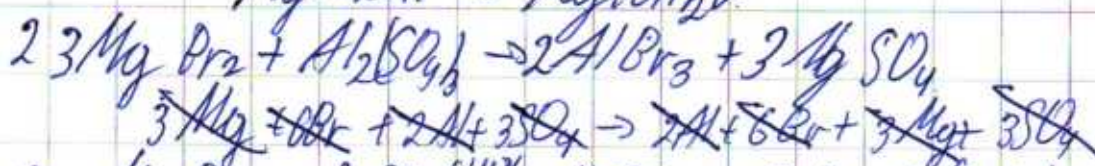
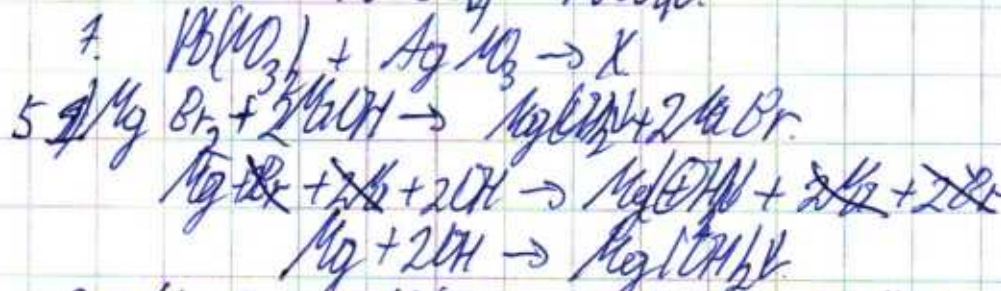
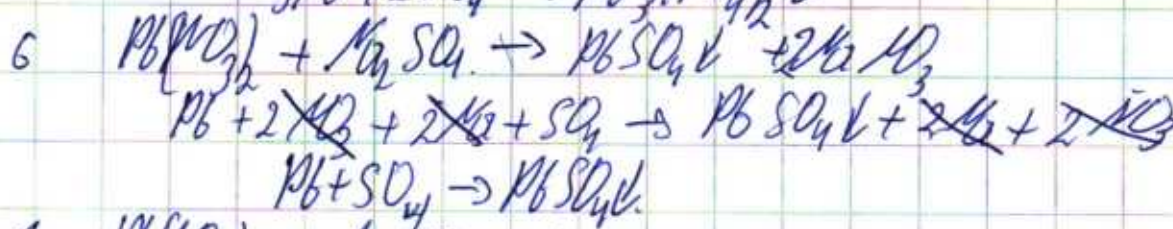
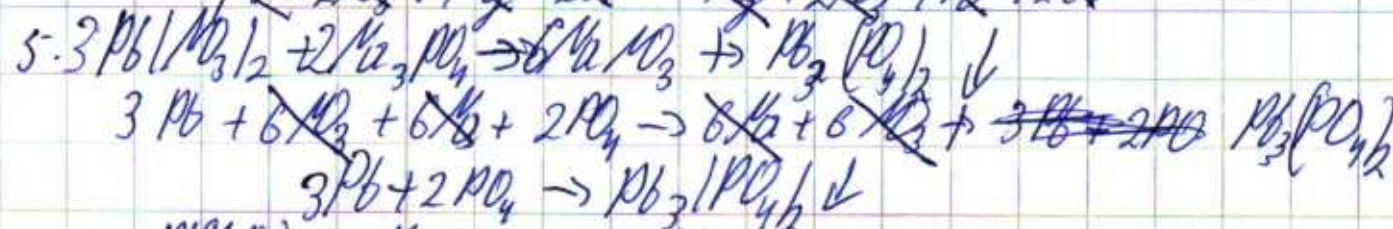
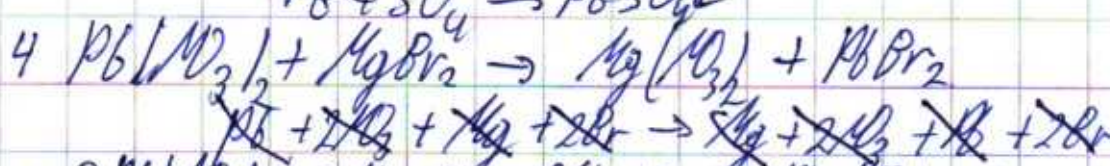
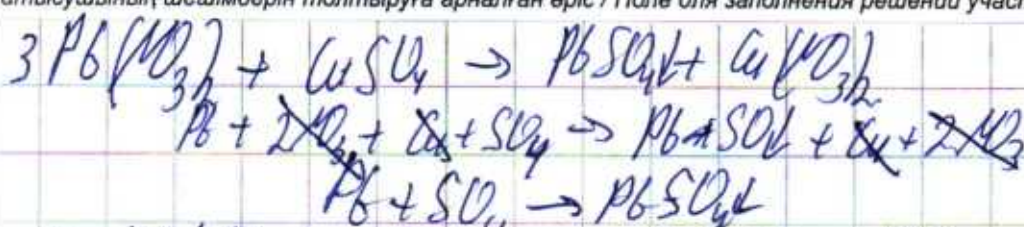
	NaOH	$\text{Al}_2(\text{SO}_4)_3$	CuSO_4	$\text{Pb}(\text{NO}_3)_2$	MgBr_2	K_2PO_4	K_2SO_4	AgNO_3
NaOH	NaOH	$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$	$\times$ реакция жүрмейді	реакция жүрмейді	?
$\text{Al}_2(\text{SO}_4)_3$	$\downarrow$	M	реакция жүрмейді	$\downarrow$	реакция жүрмейді	$\downarrow$	реакция жүрмейді	реакция жүрмейді
CuSO_4	$\downarrow$	реакция жүрмейді	M	$\downarrow$	$\downarrow$?	$\downarrow$	реакция жүрмейді	реакция жүрмейді
$\text{Pb}(\text{NO}_3)_2$	$\downarrow$	$\downarrow$	$\downarrow$	M	реакция жүрмейді	$\downarrow$	$\downarrow$	реакция жүрмейді
MgBr_2	$\downarrow$	реакция жүрмейді	$\downarrow$?	ешіктері қалыптасуы	M	ешіктері қалыптасуы	ешіктері қалыптасуы	$\downarrow$
K_2PO_4	—	—	$\downarrow$	$\downarrow$	—	M	—	$\downarrow$
K_2SO_4	—	? $\downarrow$	? $\downarrow$	$\downarrow$	—	—	M	—
AgNO_3	$\uparrow$							M

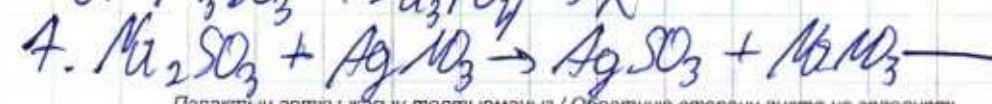
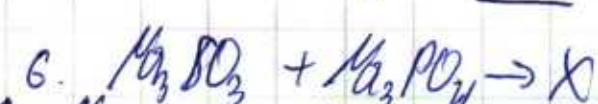
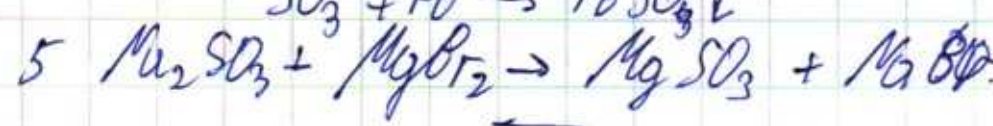
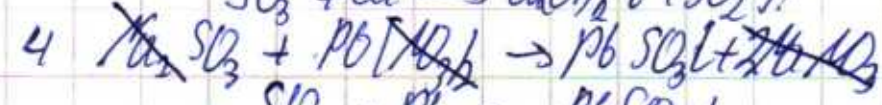
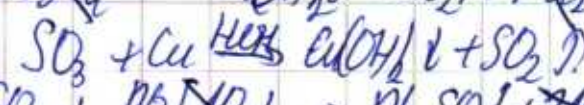
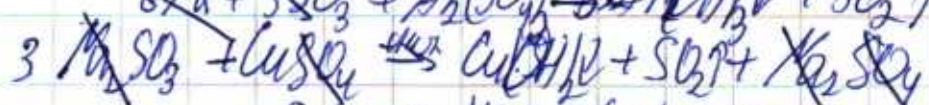
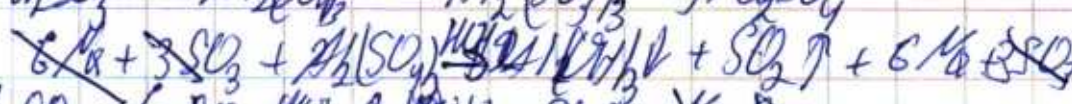
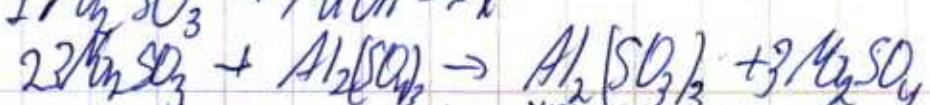
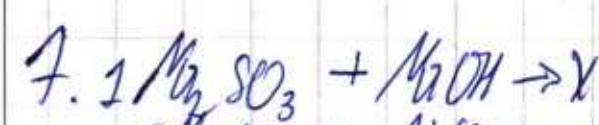
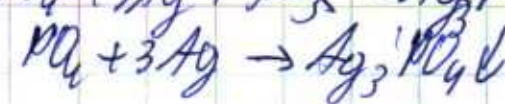
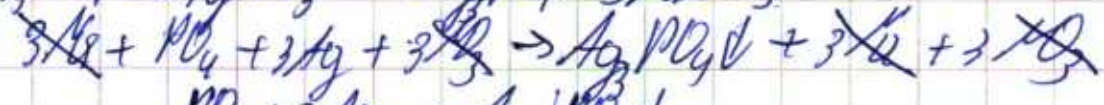
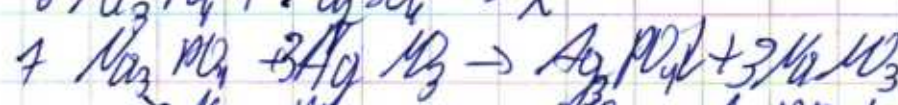
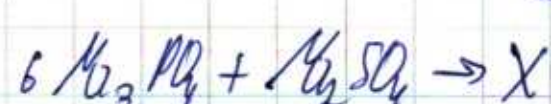
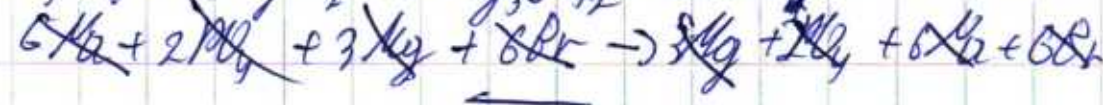
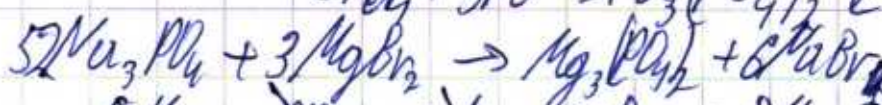
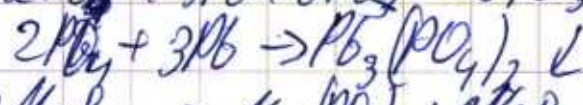
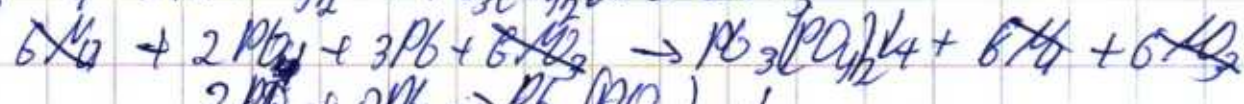
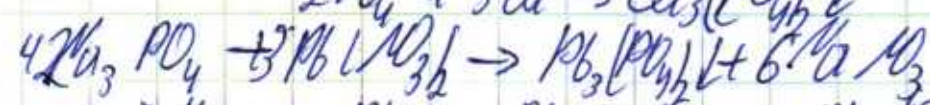
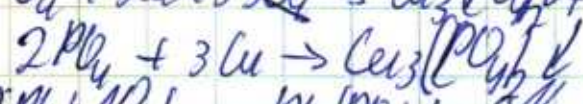
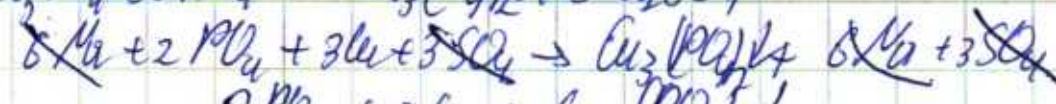
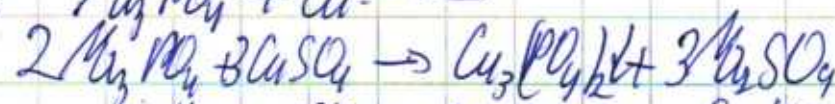
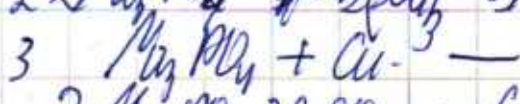
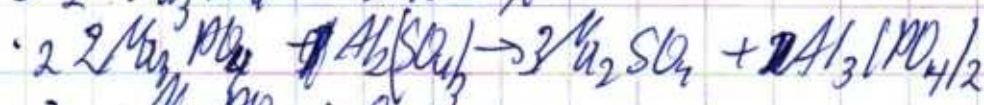
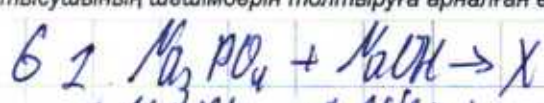
- 1) $6\text{NaOH} + \text{Al}_2(\text{SO}_4)_3 \rightarrow 3\text{Na}_2\text{SO}_4 + 2\text{Al}(\text{OH})_3 \downarrow$
- 2) $2\text{NaOH} + \text{CuSO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{Cu}(\text{OH})_2 \downarrow$
- 3) $2\text{NaOH} + \text{Pb}(\text{NO}_3)_2 \rightarrow \text{PbO} + 2\text{NaNO}_3 + \text{H}_2\text{O}$
- 4) $\text{NaOH} + \text{MgBr}_2 \rightarrow \text{MgO} + 2\text{NaBr}$
- 5) $\text{NaOH} + \text{K}_2\text{PO}_4 \rightarrow \text{X}$
- 6) $\text{NaOH} + \text{K}_2\text{SO}_4 \rightarrow \text{X}$
- 4) $\text{NaOH} + \text{AgNO}_3 \rightarrow \text{AgOH} + \text{NaNO}_3$

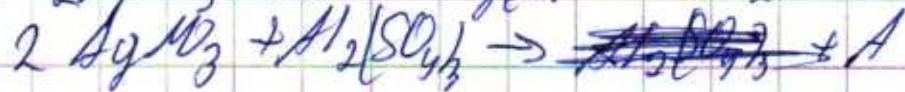
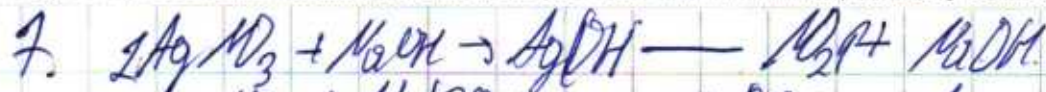


ешіміне қамшыға









8 белгілермен

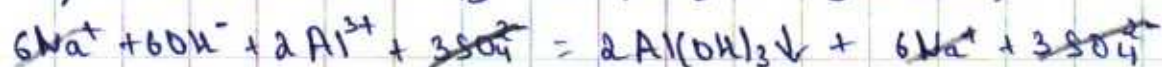
нөлдік ден түз

ерітінділері:

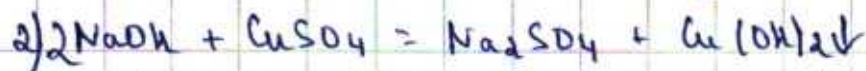
- 1) NaOH
- 2) $\text{Al}_2(\text{SO}_4)_3$
- 3) CuSO_4
- 4) $\text{Pb}(\text{NO}_3)_2$

- 5) MgBr_2
- 6) Na_3PO_4
- 7) Na_2S
- 8) AgNO_3

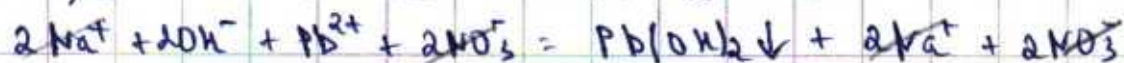
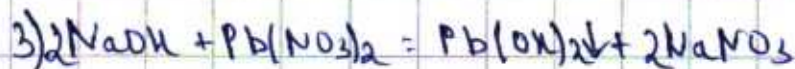
	Na^+	Al^{3+}	Cu^{2+}	Pb^{2+}	Mg^{2+}	Na^+	Na^+	Ag^+	Σ
OH^-	-	$\text{Al}(\text{OH})_3 \downarrow$ ак	$\text{Cu}(\text{OH})_2 \downarrow$ көк	$\text{Pb}(\text{OH})_2 \downarrow$ ак	$\text{Mg}(\text{OH})_2 \downarrow$ ак	-	-	-	4 түнба (↓)
SO_4^{2-}	-	-	-	$\text{PbSO}_4 \downarrow$ ак	-	-	-	-	↓, ↑ мөк
SO_4^{2-}	-	-	-	-	-	-	-	-	↓, ↑ мөк
NO_3^-	-	-	-	-	-	-	-	-	↑, ↓ мөк
Br^-	-	-	-	-	-	-	-	$\text{AgBr} \downarrow$ ак, мөк са- ры	1 түнба
PO_4^{3-}	-	$\text{AlPO}_4 \downarrow$ ак	$\text{Cu}_3(\text{PO}_4)_2 \downarrow$ түнба	$\text{Pb}_3(\text{PO}_4)_2 \downarrow$ түнба	-	-	-	$\text{Ag}_3\text{PO}_4 \downarrow$ кристалл сары	4 түнба
S^{2-}	-	-	$\text{CuS} \downarrow$ қара	$\text{PbS} \downarrow$ қара	-	-	-	$\text{Ag}_2\text{S} \downarrow$ сұр	3 түнба
NO_3^-	-	-	-	-	-	-	-	-	↓, ↑ мөк
Σ	↓ мөк; ↑ мөк	2 түнба (↓)	3↓	3↓	1↓	↓ мөк; ↑ мөк	↓ мөк; 2 мөк	3↓	



$\text{Al}(\text{OH})_3$ - іркіңсақ, ак түнба



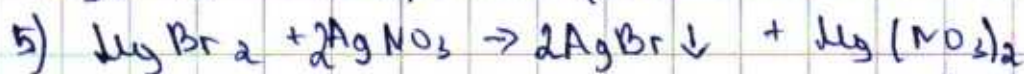
$\text{Cu}(\text{OH})_2$ - көк, көңгісір түсі түнба



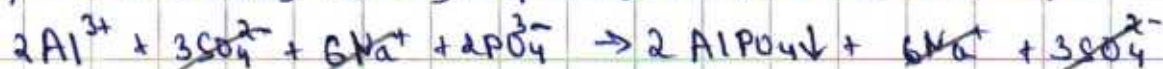
$\text{Pb}(\text{OH})_2$ - ак түсі түнба



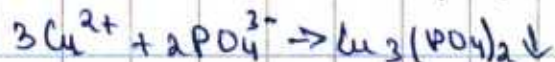
$\text{Hg}(\text{OH})_2$ - ақ түсті тұнба



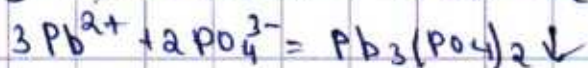
AgBr - ақшыл сары түсті тұнба



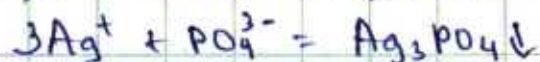
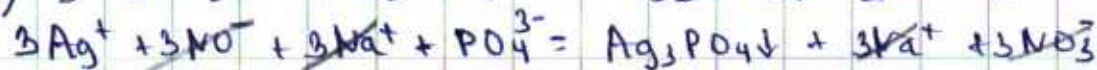
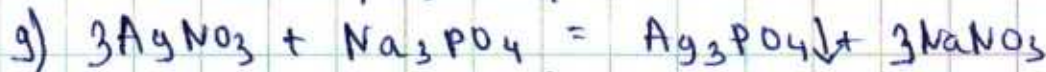
AlPO_4 - ақ түсті тұнба



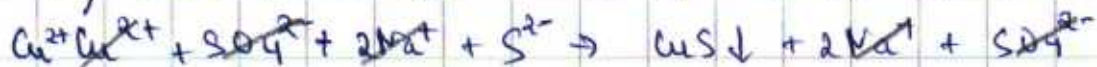
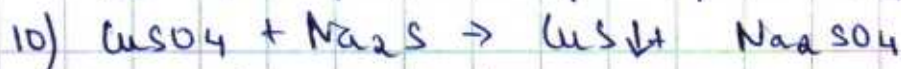
$\text{Cu}_3(\text{PO}_4)_2$ - қара түсті тұнба



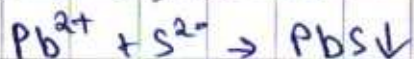
$\text{Pb}_3(\text{PO}_4)_2$ - түссіз тұнба



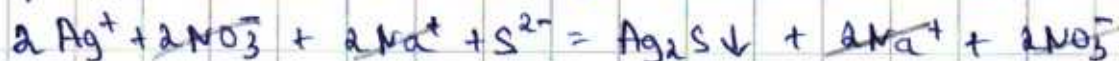
Ag_3PO_4 - кристалл сары түсті тұнба



CuS - қара түсті тұнба

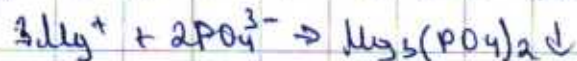
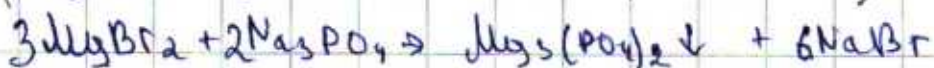
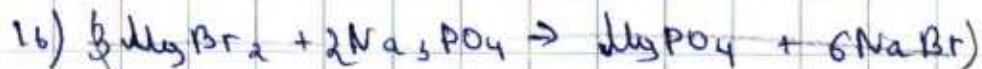
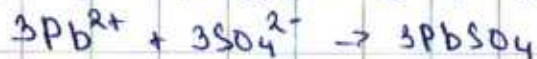
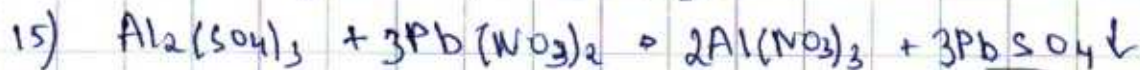


PbS - қара түрлі тұнба



Ag_2S - сұр түрлі тұнба

А3 есугі:



А3 есугі: PbBr_2 , Ag_2SO_4 , PbSO_4 , $\text{Hg}_3(\text{PO}_4)_2$

1. NaOH (натрий гидроксиді) H_2O түзілуіне келетін болса, Na_2O (натрий оксиді) + H_2O (су) қосу арқылы түзілетін гидроксид моле. яғни сілті.

NaOH бізде суда еркін қосыластардың бірі, тұнбаға жатпайды, және Na -IA тобындағы негізгі элементіне жатады.

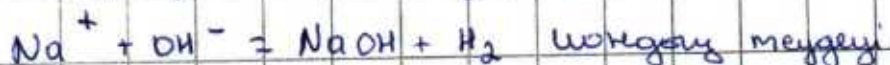
NaOH -ті екі жағдайда ала аламыз.

1. $\text{Na}_2\text{O} + \text{H}_2\text{O} = \text{NaOH}$ негіздің оксиді + су = сілті
 $\text{MeO} + \text{H}_2\text{O} = \text{MeOH}$

2. $\text{Na} + \text{H}_2\text{O} = \text{NaOH} + \text{H}_2 \uparrow$ белсенді металл + су = сілті + газ
 $\text{Me} + \text{H}_2\text{O} = \text{MeOH} + \text{H}_2 \uparrow$

Еңе жағдайға келетін болса, бізде суда ері алатын сілті мен газ бөлініп тұр.

$\text{H}_2 \uparrow$ газы бізде - тұссіз, иіссіз болып келеді.



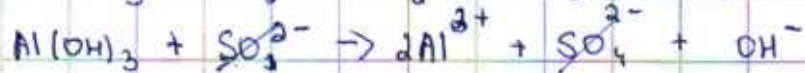
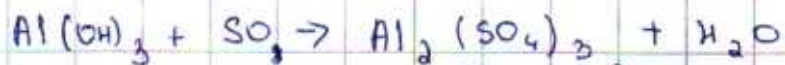
2. $\text{Al}_2(\text{SO}_4)_3$ - алюминий сульфаты. Еңе реакцияға тақта-латын болса, тұзға жатады. және $\text{Al}_2(\text{SO}_4)_3$ суда ерітін тұздардың бірі.

H_2SO_4 деліміз - металл және қышқыл қосылыстарының тұра-тын күрделі қосылыстардың бірі.

H_2SO_4 түзілуіне келетін болса:

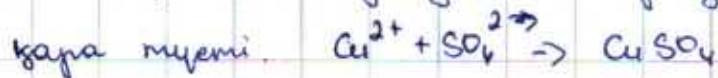
Негіздің оксиді + қышқылдың оксиді = тұз $(\text{MeO} + \text{XO} = \text{MeX})$

сілті + қышқыл оксиді = тұз + су

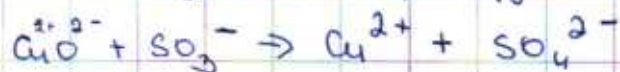
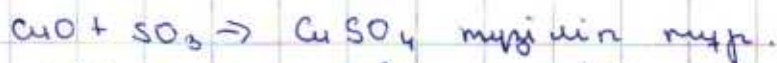


$\text{Al}(\text{OH})_3$ - суда ерімейді.

3. CuSO_4 - көк сульфат. Ерімді. Яғни бұл тұз суда ерімді.

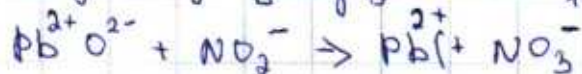


Түзілуі:

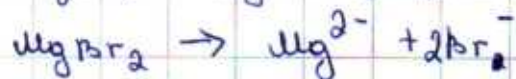


4. $\text{Pb}(\text{NO}_3)_2$ - қорғасын нитраты. Суда ерігіштігі бойынша тұзға түзіліп жатыр.

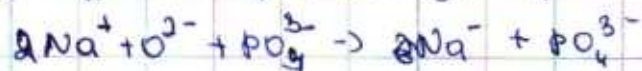
$\text{PbO} + \text{NO}_2 \rightarrow \text{Pb}(\text{NO}_3)_2$ яғни қорғасын оксидіне + қоспаны оксидін ұсып алумен тұз ала аламыз.



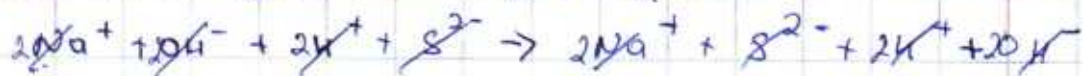
5. MgBr_2 - магний бромиді. Суда ерігіштігі бойынша суда ерімді, түзілуі ау түс. Br^- қоспаны қандай.



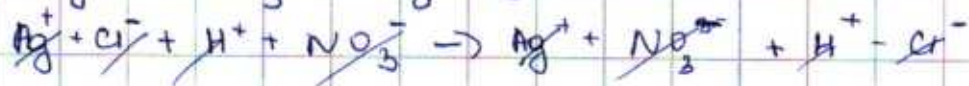
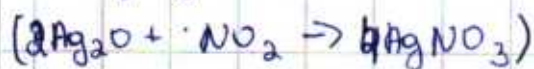
6. Na_3PO_4 - натрий фосфаты. Суда ерігіштігі бойынша суда ерімді.



7. Na_2S - натрий сульфиді. Бейсенді металдан және қышқыл қандығаннан тұрады. Ақ.



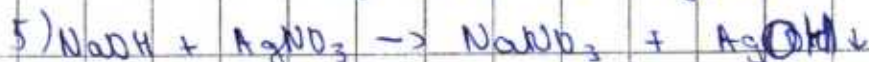
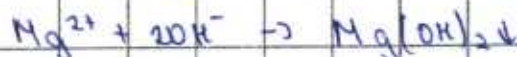
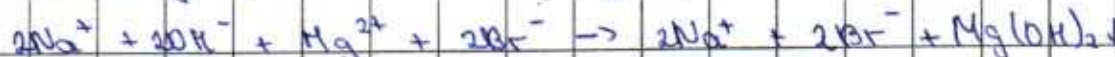
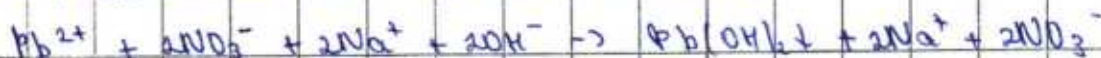
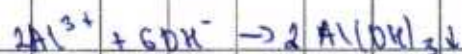
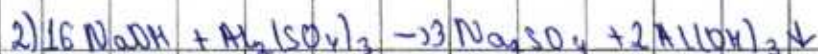
8. AgNO_3 - суда ері алады және 100°C суда 1.2 -нан артық ері алады. (ақ түсті) Mg , Mg - метал және қышқыл қандығаннан тұрады. Мүддені қосады.

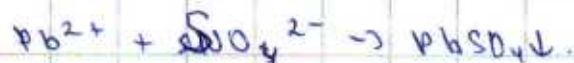
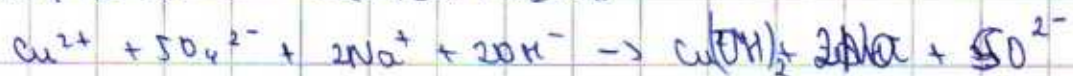
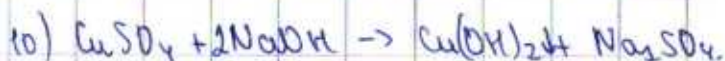
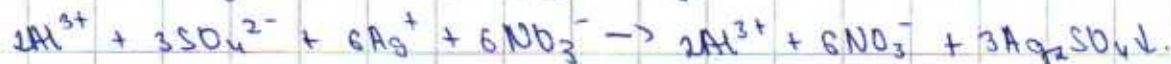
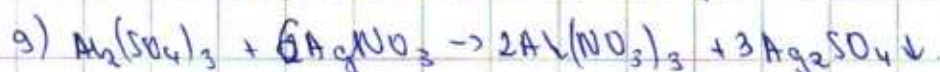
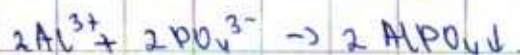
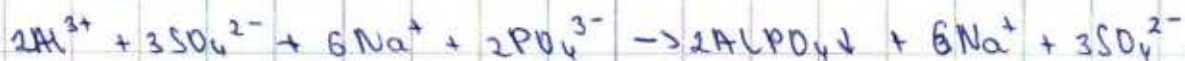
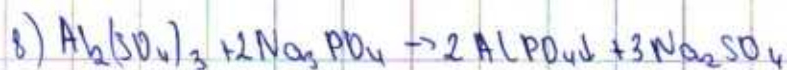
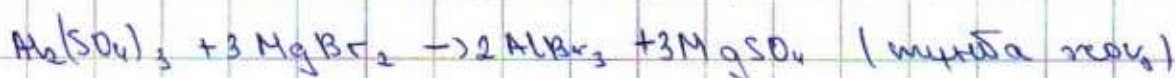
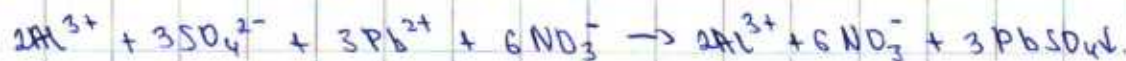
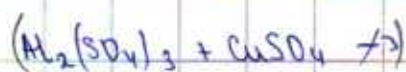
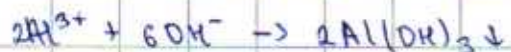
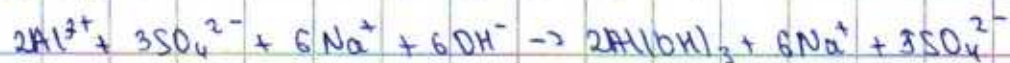


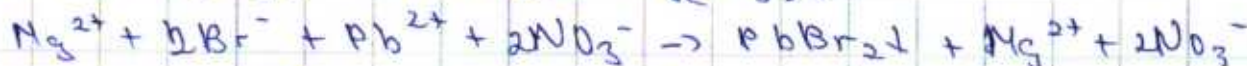
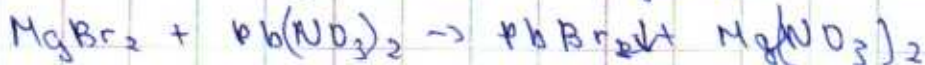
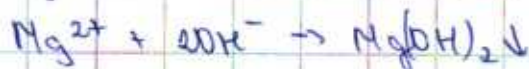
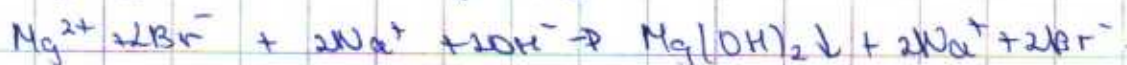
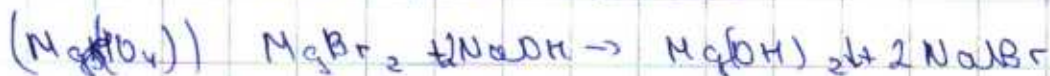
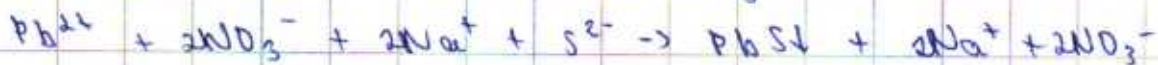
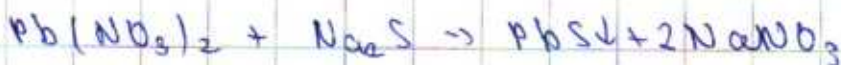
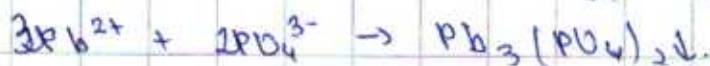
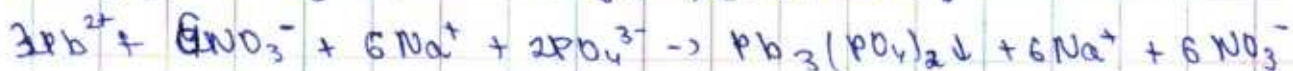
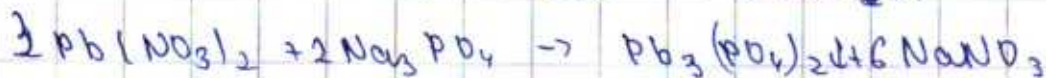
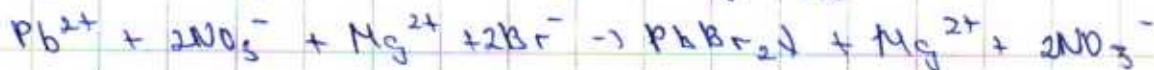
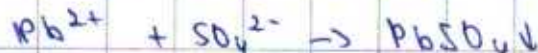
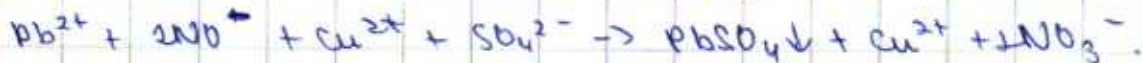
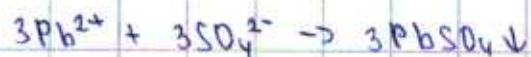
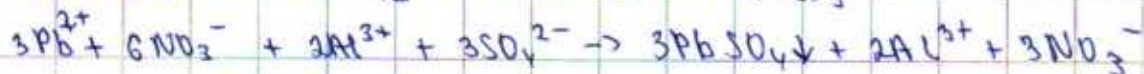
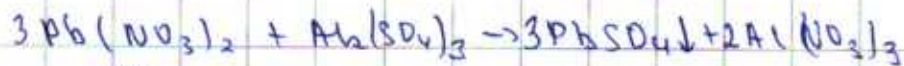
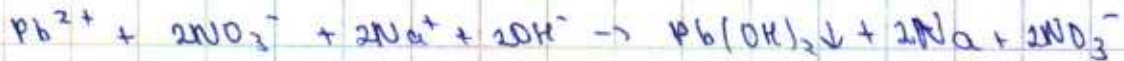
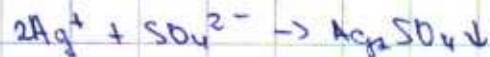
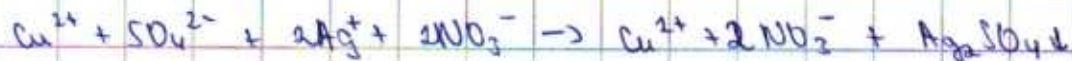
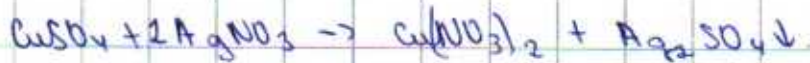
Бұл барлық 8 бейорганикалық қосынды химиялық реакция түрінде тұр. Химиялық реакция бейорганикалық қосындылар, мысалы, газдар, ерітінділер, м.б. бейорганикалық заттар. Бейорганикалық заттар негіз, тұз ерітінділері. Негіз - бұл I, II топтардағы бейсенді металдар болса, тұз - метал және қышқыл қандығаннан тұрады. Мүддені қосады.

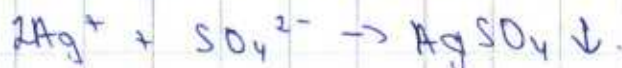
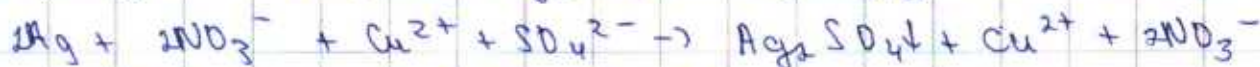
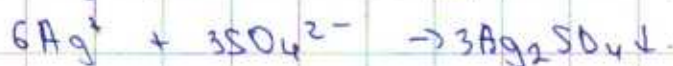
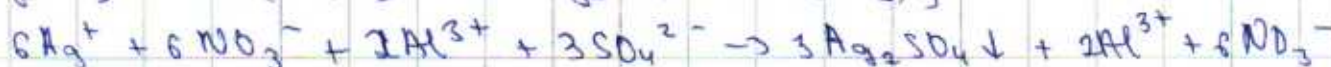
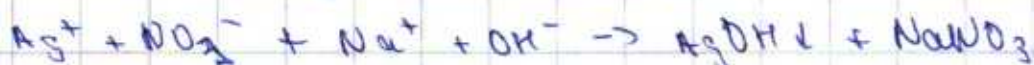
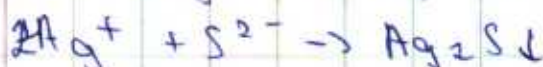
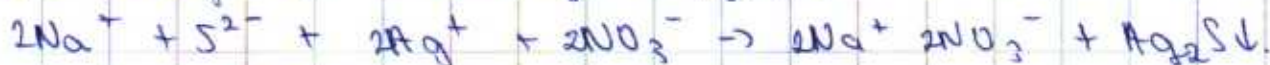
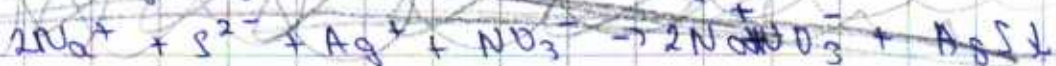
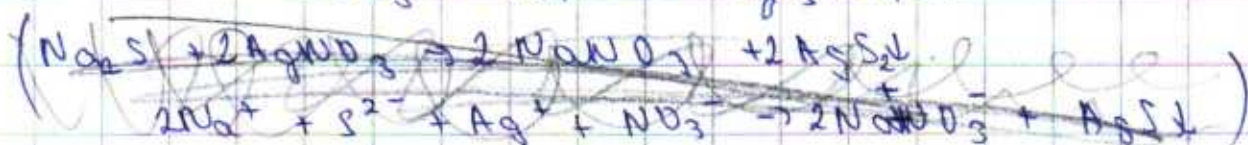
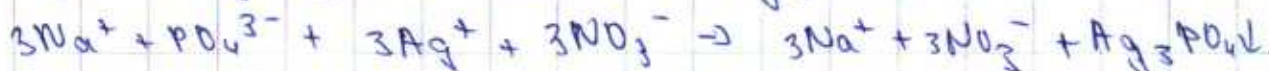
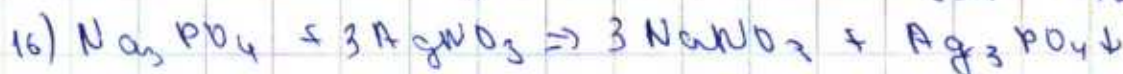
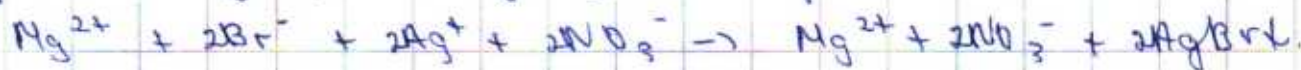
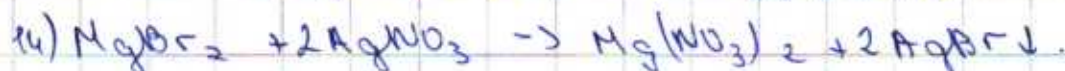
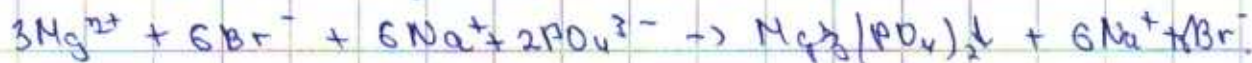
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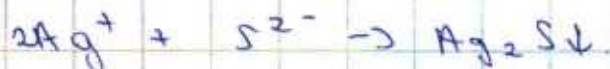
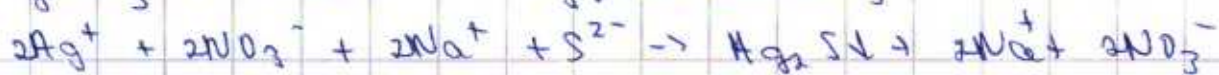
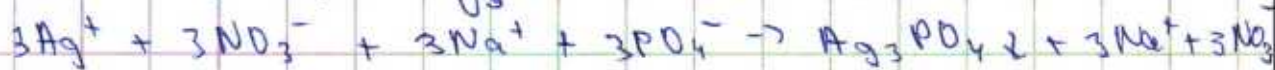
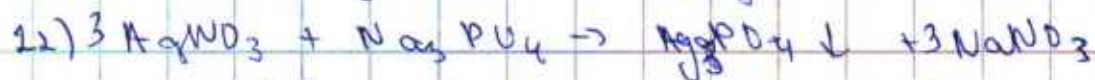
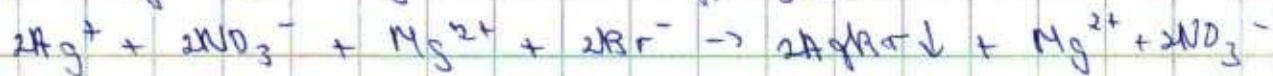
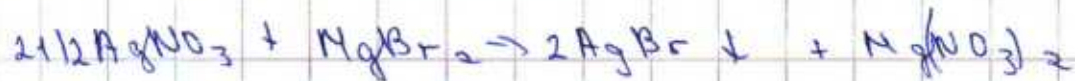
	NaOH	Al ₂ (SO ₄) ₃	CuSO ₄	Pb(NO ₃) ₂	MgBr ₂	Na ₃ PO ₄	Na ₂ S	AgNO ₃	Σ
NaOH		↓ ос	↓ ос	↓ ос	↓ ос	—	—	↓ ос	5↓ (3 ос, 2 ос)
Al ₂ (SO ₄) ₃	↓ ос		—	↓ ос	—	↓ ос	—	↓ ос	4↓ ос
CuSO ₄	↓ ос	—		↓ ос	—	↓ ос	↓ ос	↓ ос	5↓ ос (2 ос, 1 ос, 1 ос)
Pb(NO ₃) ₂	↓ ос	↓ ос	↓ ос		↓ ос	↓ ос	↓ ос	—	6↓ ос
MgBr ₂	↓ ос	—	—	↓ ос		↓ ос	—	↓ ос	4↓ ос (1 ос, 1 ос, 1 ос, 1 ос)
Na ₃ PO ₄	—	↓ ос	↓ ос	↓ ос	↓ ос		—	↓ ос	5↓ ос (1 ос, 1 ос, 1 ос, 1 ос, 1 ос)
Na ₂ S	—	—	↓ ос	↓ ос	—	—		↓ ос	3↓ ос (1 ос, 1 ос, 1 ос)
AgNO ₃	↓ ос	↓ ос	↓ ос	—	↓ ос	↓ ос	↓ ос		6↓ ос (1 ос, 1 ос, 1 ос, 1 ос, 1 ос, 1 ос)
Σ	5↓ (3 ос, 2 ос)	4↓ ос	5↓ (3 ос, 1 ос, 1 ос)	6↓ ос	4↓ ос (1 ос, 1 ос, 1 ос, 1 ос)	5↓ ос (1 ос, 1 ос, 1 ос, 1 ос, 1 ос)	3↓ ос (1 ос, 1 ос, 1 ос)	5↓ ос (1 ос, 1 ос, 1 ос, 1 ос, 1 ос)	



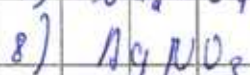
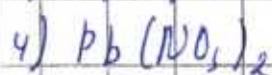
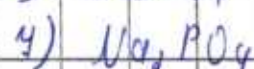
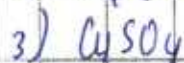
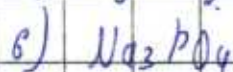
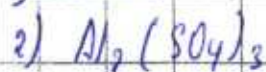
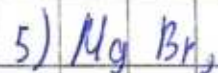
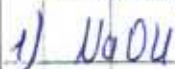




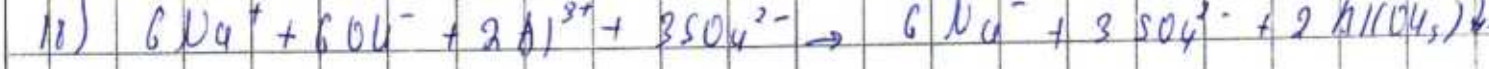
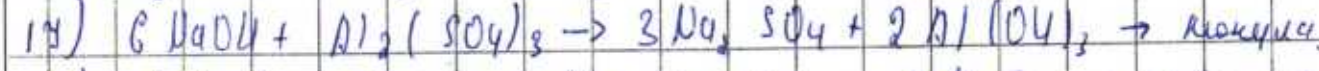
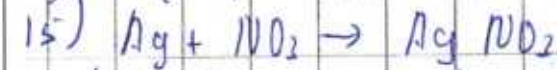
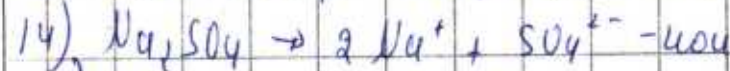
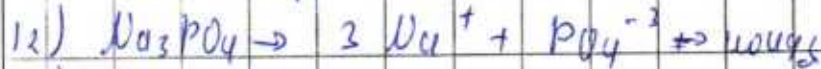
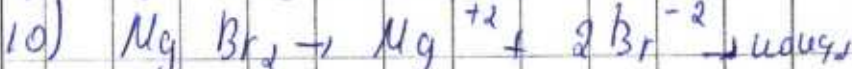
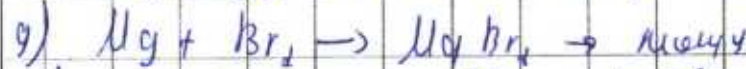
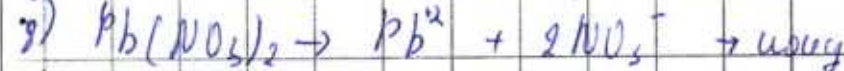
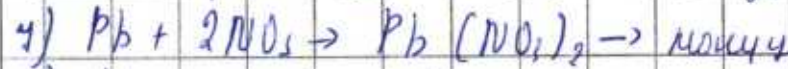
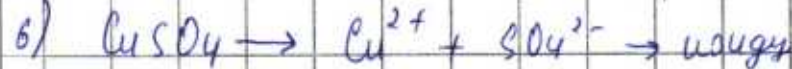
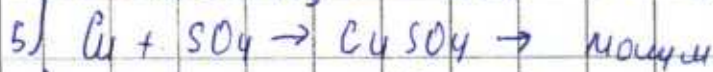
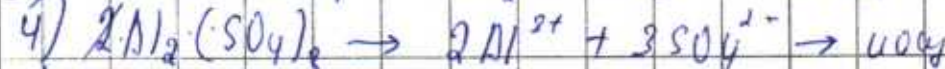
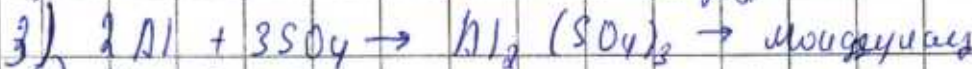
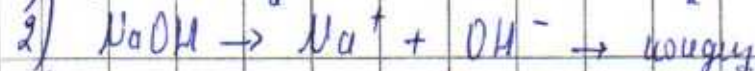
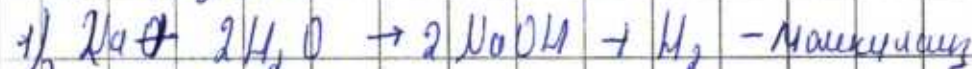




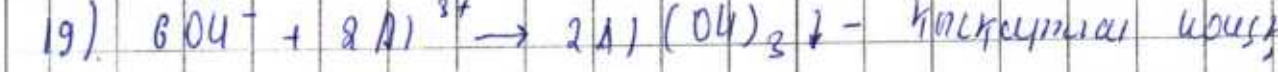
8 - белгілі ион.



ПРАКТИКА



- ион



- 20) $\text{CuSO}_4 + 2\text{NaOH} \rightarrow \text{Cu}(\text{OH})_2 \downarrow + \text{Na}_2\text{SO}_4$ - менчик
- 21) $\text{Cu}^{+} + \text{SO}_4^{2-} + 2\text{Na}^{+} + 2\text{OH}^{-} \rightarrow \text{Cu}(\text{OH})_2 \downarrow + 2\text{Na}^{+} + \text{SO}_4^{2-}$ - менчик
- 22) $\text{Cu}^{+} + 2\text{OH}^{-} \rightarrow \text{Cu}(\text{OH})_2 \downarrow$ - қысқартқан ион
- 23) $\text{Pb}(\text{NO}_3)_2 + 2\text{NaOH} \rightarrow \text{Pb}(\text{OH})_2 \downarrow + 2\text{NaNO}_3$ - менчик
- 24) $\text{Pb}^{+2} + 2\text{NO}_3^{-} + 2\text{Na}^{+} + 2\text{OH}^{-} \rightarrow \text{Pb}(\text{OH})_2 \downarrow + 2\text{Na}^{+} + 2\text{NO}_3^{-}$ - менчик
- 25) $\text{Pb}^{+2} + 2\text{OH}^{-} \rightarrow \text{Pb}(\text{OH})_2 \downarrow$ - қысқартқан ион
- 26) $2\text{NaOH} + \text{MgBr}_2 \rightarrow \text{Mg}(\text{OH})_2 \downarrow + 2\text{NaBr}$ - менчик
- 27) $2\text{Na}^{+} + 2\text{OH}^{-} + \text{Mg}^{+2} + 2\text{Br}^{-} \rightarrow \text{Mg}(\text{OH})_2 \downarrow + 2\text{Na}^{+} + 2\text{Br}^{-}$ - менчик
- 28) $2\text{OH}^{-} + \text{Mg}^{+2} \rightarrow \text{Mg}(\text{OH})_2 \downarrow$ - қысқартқан ион
- 29) $\text{CuSO}_4 + 2\text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{Ag}_2\text{SO}_4$ - менчик
- 30) $\text{Cu}^{+} + \text{SO}_4^{2-} + 2\text{Ag}^{+} + 2\text{NO}_3^{-} \rightarrow \text{Cu}^{+2} + 2\text{NO}_3^{-} + 2\text{Ag}^{+} + \text{NO}_2^{-}$ - менчик
- 31) $\text{Al}_2(\text{SO}_4)_3 + 2\text{Na}_3\text{PO}_4 \rightarrow 2\text{AlPO}_4 \downarrow + 3\text{Na}_2\text{SO}_4$ - менчик
- 32) $2\text{Al}^{3+} + 3\text{SO}_4^{2-} + 6\text{Na}^{+} + 2\text{PO}_4^{3-} \rightarrow 2\text{AlPO}_4 \downarrow + 6\text{Na}^{+} + 3\text{SO}_4^{2-}$ - менчик
- 33) $2\text{Al}^{3+} + 2\text{PO}_4^{3-} \rightarrow 2\text{AlPO}_4 \downarrow$ - қысқартқан ион
- 34) $3\text{Pb}(\text{NO}_3)_2 + 2\text{Na}_3\text{PO}_4 \rightarrow \text{Pb}_3(\text{PO}_4)_2 \downarrow + 6\text{NaNO}_3$ - менчик
- 35) $3\text{Pb}^{+2} + 6\text{NO}_3^{-} + 6\text{Na}^{+} + 2\text{PO}_4^{3-} \rightarrow \text{Pb}_3(\text{PO}_4)_2 \downarrow + 6\text{Na}^{+} + 6\text{NO}_3^{-}$ - менчик
- 36) $3\text{Pb}^{+2} + 2\text{PO}_4^{3-} \rightarrow \text{Pb}_3(\text{PO}_4)_2 \downarrow$ - қысқартқан ион
- 37) $\text{Pb}(\text{NO}_3)_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{PbSO}_4 \downarrow + 2\text{NaNO}_3$ - менчик
- 38) $\text{Pb}^{+2} + 2\text{NO}_3^{-} + 2\text{Na}^{+} + \text{SO}_4^{2-} \rightarrow \text{PbSO}_4 \downarrow + 2\text{Na}^{+} + 2\text{NO}_3^{-}$ - менчик
- 39) $\text{Pb}^{+2} + \text{SO}_4^{2-} \rightarrow \text{PbSO}_4 \downarrow$ - қысқартқан ион
- 40) $3\text{MgBr}_2 + 2\text{Na}_3\text{PO}_4 \rightarrow \text{Mg}_3(\text{PO}_4)_2 \downarrow + 6\text{NaBr}$ - менчик
- 41) $3\text{Mg}^{+2} + 6\text{Br}^{-} + 6\text{Na}^{+} + 2\text{PO}_4^{3-} \rightarrow 3\text{Mg}^{+2} + 2\text{PO}_4^{3-} + 6\text{Na}^{+} + 6\text{Br}^{-}$ - менчик

- 43) $MgBr_2 + 2AgNO_3 \rightarrow Mg(NO_3)_2 + 2AgBr$ мәнцасы
- 44) $Mg^{2+} + 2Br^- + 2Ag^+ + 2NO_3^- \rightarrow Mg^{2+} + 2NO_3^- + 2AgBr \downarrow$ шол.
- 45) $2Br^- + 2Ag^+ \rightarrow 2AgBr \downarrow$ қысқаша шол.

Теориясы матрица

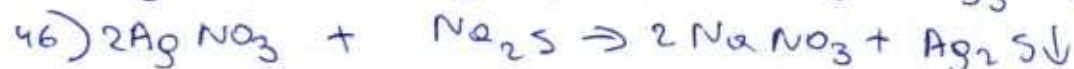
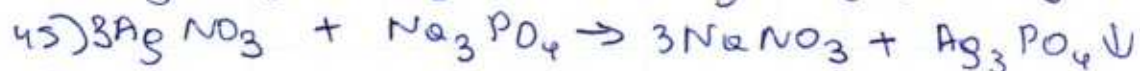
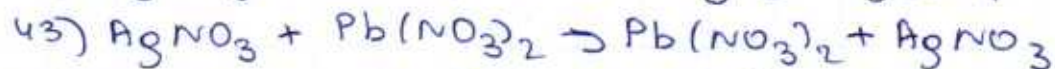
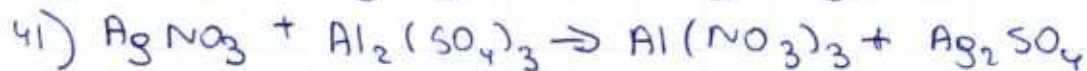
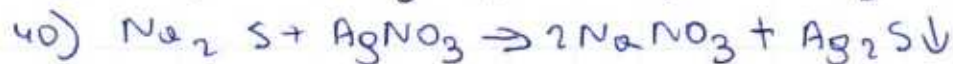
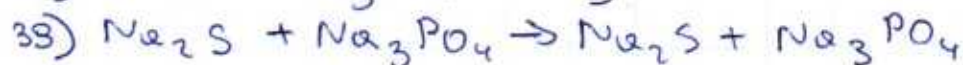
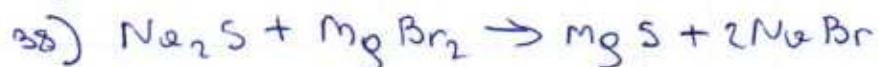
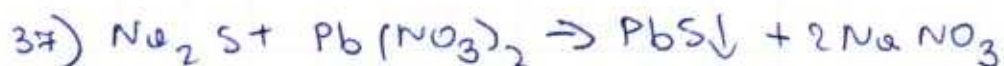
- 1) $AgNO_3 \rightarrow ar$
- 2) $Al_2(SO_4)_3 \rightarrow er-gi$ ершгі.
- 3) $NaOH \rightarrow ci$ ті қытм.
- 4) $Pb(NO_3)_2$
- 5) $Na_2SO_4 \rightarrow$ қытм. қыш.
- 6) $Na_3PO_4 \rightarrow$ қыш. қытм.

1) Реак	NaOH	Al ₂ (SO ₄) ₃	CuSO ₄	Pb(NO ₃) ₂	MgBr ₂	Na ₃ PO ₄	Na ₂ S
NaOH	—	2Al(OH) ₃ ↓	Cu(OH) ₂ ↓	Pb(OH) ₂ ↓	Mg(OH) ₂	—	—
Al ₂ (SO ₄) ₃	2Al(OH) ₃	—	—	—	—	2AlPO ₄ ↓	—
CuSO ₄	Cu(OH) ₂	—	—	Cu₃(PO₄)₂↓	—	Cu ₃ (PO ₄) ₂ ↓	CuS↓
Pb(NO ₃) ₂	Pb(OH) ₂	—	—	—	—	2Pb ₃ (PO ₄) ₂ ↓	PbS↓
MgBr ₂	Mg(OH) ₂	—	—	—	—	Mg ₃ (PO ₄) ₂ ↓	—
Na ₃ PO ₄	—	2AlPO ₄ ↓	Cu ₃ (PO ₄) ₂ ↓	2Pb ₃ (PO ₄) ₂ ↓	Mg ₃ (PO ₄) ₂ ↓	—	—
Na ₂ S	—	—	CuS↓	PbS↓	—	—	—
AgNO ₃	—	—	—	—	2AgBr↓	Ag ₃ PO ₄ ↓	Ag ₂ S↓

	AgNO ₃
NaOH	—
Al ₂ (SO ₄) ₃	—
CuSO ₄	—
Pb(NO ₃) ₂	—
MgBr ₂	2AgBr↓
Na ₃ PO ₄	Ag ₃ PO ₄ ↓
Na ₂ S	Ag ₂ S↓
AgNO ₃	—

- 1) $\text{NaOH} + \text{Al}_2(\text{SO}_4)_3 \rightarrow 3\text{Na}_2\text{SO}_4 + 2\text{Al}(\text{OH})_3$
- 2) $2\text{NaOH} + \text{CuSO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{Cu}(\text{OH})_2 \downarrow$
- 3) $2\text{NaOH} + \text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{NaNO}_3 + \text{Pb}(\text{OH})_2 \downarrow$
- 4) $2\text{NaOH} + \text{MgBr}_2 \rightarrow 2\text{NaBr} + \text{Mg}(\text{OH})_2 \downarrow$
- 5) $\text{NaOH} + \text{Na}_3\text{PO}_4 \rightarrow \text{Na}_3\text{PO}_4 + \text{NaOH}$
- 6) $\text{NaOH} + \text{Na}_2\text{S} \rightarrow \text{Na}_2\text{S} + \text{NaOH}$
- 7) $\text{NaOH} + \text{AgNO}_3 \rightarrow \text{NaNO}_3 + \text{AgOH}$
- 8) $\text{Al}_2(\text{SO}_4)_3 + \text{CuSO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + \text{CuSO}_4$
- 9) $\text{Al}_2(\text{SO}_4)_3 + 3\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{Al}(\text{NO}_3)_3 + 3\text{PbSO}_4$

- 10) $\text{Al}_2(\text{SO}_4)_3 + \text{MgBr}_2 \rightarrow \text{AlBr}_3 + \text{MgSO}_4$
- 11) $\text{Al}_2(\text{SO}_4)_3 + 2\text{Na}_3\text{PO}_4 \rightarrow 2\text{AlPO}_4 \downarrow + 3\text{Na}_2\text{SO}_4$
- 12) $\text{Al}_2(\text{SO}_4)_3 + \text{Na}_2\text{S} \rightarrow \text{Al}_2\text{S}_3 + \text{Na}_2\text{SO}_4$
- 13) $\text{Al}_2(\text{SO}_4)_3 + \text{AgNO}_3 \rightarrow \text{Al}(\text{NO}_3)_3 + \text{Ag}_2\text{SO}_4$
- 14) $\text{CuSO}_4 + \text{Pb}(\text{NO}_3)_2 \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{PbSO}_4$
- 15) $\text{CuSO}_4 + \text{MgBr}_2 \rightarrow \text{CuBr}_2 + \text{MgSO}_4$
- 16) $3\text{CuSO}_4 + 2\text{Na}_3\text{PO}_4 \rightarrow \text{Cu}_3(\text{PO}_4)_2 \downarrow + 3\text{Na}_2\text{SO}_4$
- 17) $\text{CuSO}_4 + \text{Na}_2\text{S} \rightarrow \text{CuS} \downarrow + \text{Na}_2\text{SO}_4$
- 18) $\text{CuSO}_4 + 2\text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{Ag}_2\text{SO}_4$
- 19) $\text{Pb}(\text{NO}_3)_2 + \text{CuSO}_4 \rightarrow \text{PbSO}_4 + \text{Cu}(\text{NO}_3)_2$
- 20) $\text{Pb}(\text{NO}_3)_2 + \text{MgBr}_2 \rightarrow \text{PbBr}_2 + \text{Mg}(\text{NO}_3)_2$
- 21) $6\text{Pb}(\text{NO}_3)_2 + 4\text{Na}_3\text{PO}_4 \rightarrow 2\text{Pb}_3(\text{PO}_4)_2 + 12\text{NaNO}_3$
- 22) $\text{Pb}(\text{NO}_3)_2 + \text{Na}_2\text{S} \rightarrow \text{PbS} \downarrow + 2\text{NaNO}_3$
- 23) $\text{Pb}(\text{NO}_3)_2 + \text{AgNO}_3 \rightarrow \text{Pb}(\text{NO}_3)_2 + \text{AgNO}_3$
- 24) $\text{MgBr}_2 + \text{CuSO}_4 \rightarrow \text{MgSO}_4 + \text{CuBr}_2$
- 25) $\text{MgBr}_2 + \text{Pb}(\text{NO}_3)_2 \rightarrow \text{Mg}(\text{NO}_3)_2 + \text{PbBr}_2$
- 26) $\text{MgBr}_2 + \text{Na}_2\text{S} \rightarrow \text{MgS} + 2\text{NaBr}$
- 27) $\text{MgBr}_2 + 2\text{AgNO}_3 \rightarrow \text{Mg}(\text{NO}_3)_2 + 2\text{AgBr} \downarrow$
- 28) $3\text{MgBr}_2 + 2\text{Na}_3\text{PO}_4 \rightarrow \text{Mg}_3(\text{PO}_4)_2 \downarrow + 6\text{NaBr}$
- 29) $\text{Na}_3\text{PO}_4 + \text{Al}_2(\text{SO}_4)_3 \rightarrow 2\text{AlPO}_4 \downarrow + 3\text{Na}_2\text{SO}_4$
- 30) $\text{Na}_3\text{PO}_4 + 3\text{CuSO}_4 \rightarrow \text{Cu}_3(\text{PO}_4)_2 + 3\text{Na}_2\text{SO}_4$
- 31) $\text{Na}_3\text{PO}_4 + 6\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{Pb}_3(\text{PO}_4)_2 + 12\text{NaNO}_3$
- 32) $2\text{Na}_3\text{PO}_4 + 3\text{MgBr}_2 \rightarrow \text{Mg}_3(\text{PO}_4)_2 \downarrow + 6\text{NaBr}$
- 33) $\text{Na}_3\text{PO}_4 + \text{Na}_2\text{S} \rightarrow \text{Na}_2\text{S} + \text{Na}_3\text{PO}_4$
- 34) $\text{Na}_3\text{PO}_4 + 3\text{AgNO}_3 \rightarrow 3\text{NaNO}_3 + \text{Ag}_3\text{PO}_4 \downarrow$
- 35) $\text{Na}_2\text{S} + \text{Al}_2(\text{SO}_4)_3 \rightarrow \text{Al}_2\text{S}_3 + \text{Na}_2\text{SO}_4$
- 36) $\text{Na}_2\text{S} + \text{CuSO}_4 \rightarrow \text{CuS} \downarrow + \text{Na}_2\text{SO}_4$



	NaOH	$\text{Al}_2(\text{SO}_4)_3$	CuSO_4	$\text{Pb}(\text{NO}_3)_2$	MgBr_2	Na_3PO_4	Na_2S	AgNO_3
NaOH	↘	$\text{Al}(\text{OH})_3 \downarrow$	$\text{Cu}(\text{OH})_2 \downarrow$	$\text{Pb}(\text{OH})_2 \downarrow$	$\text{Mg}(\text{OH})_2 \downarrow$			
$\text{Al}_2(\text{SO}_4)_3$	$\text{Al}(\text{OH})_3 \downarrow$	↘		$\text{PbSO}_4 \downarrow$		$\text{AlPO}_4 \downarrow$		
CuSO_4	$\text{Cu}(\text{OH})_2 \downarrow$		↘			$\text{Cu}_3(\text{PO}_4)_2 \downarrow$	$\text{CuS} \downarrow$	
$\text{Pb}(\text{NO}_3)_2$	$\text{Pb}(\text{OH})_2 \downarrow$	$\text{PbSO}_4 \downarrow$		↘		$\text{Pb}_3(\text{PO}_4)_2 \downarrow$	$\text{PbS} \downarrow$	
MgBr_2	$\text{Mg}(\text{OH})_2 \downarrow$				↘			$\text{AgBr} \downarrow$
Na_3PO_4		$\text{AlPO}_4 \downarrow$	$\text{Cu}_3(\text{PO}_4)_2 \downarrow$	$\text{Pb}_3(\text{PO}_4)_2 \downarrow$		↘		$\text{Ag}_3\text{PO}_4 \downarrow$
Na_2S			$\text{CuS} \downarrow$	$\text{PbS} \downarrow$			↘	$\text{Ag}_2\text{S} \downarrow$
AgNO_3					$\text{AgBr} \downarrow$	$\text{Ag}_3\text{PO}_4 \downarrow$	$\text{Ag}_2\text{S} \downarrow$	↘

$\text{Al}(\text{OH})_3$ - ақ, мұзғиқ $\downarrow$

$\text{Cu}(\text{OH})_2$ - көк $\downarrow$

$\text{Pb}(\text{OH})_2$ - қара $\downarrow$

MgBr_2 - ақ $\downarrow$

AlPO_4 - ақ $\downarrow$

$\text{Cu}_3(\text{PO}_4)_2$ - ақ $\downarrow$

CuS - қара $\downarrow$

$\text{Pb}_3(\text{PO}_4)_2$ - ақ $\downarrow$

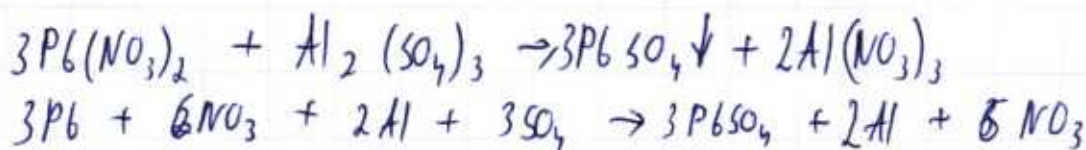
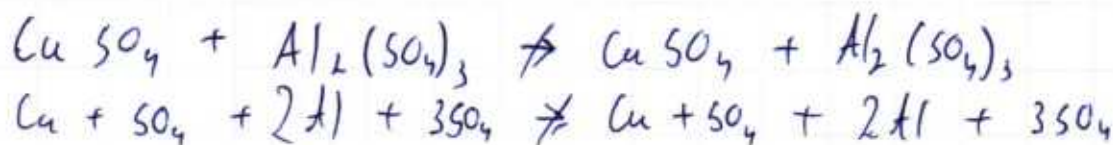
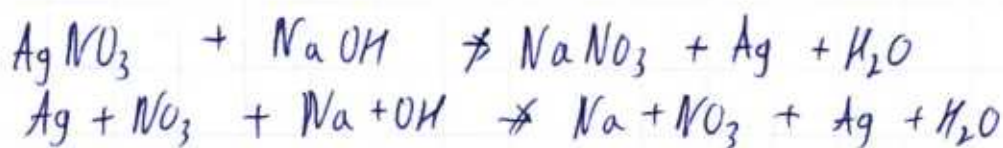
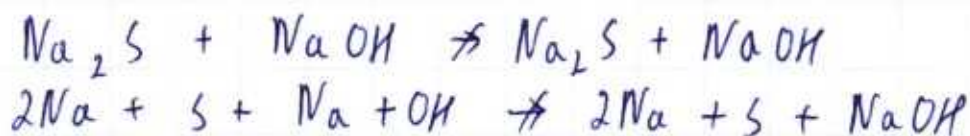
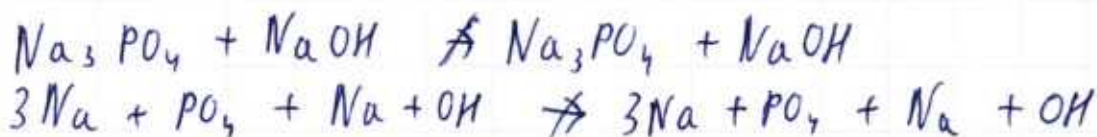
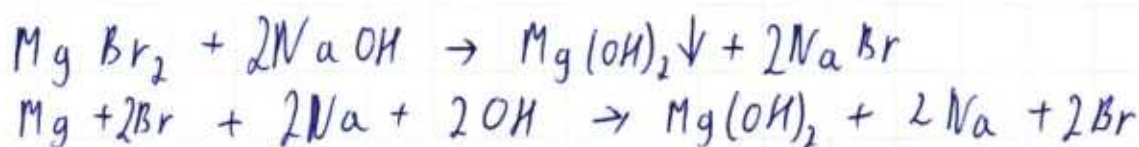
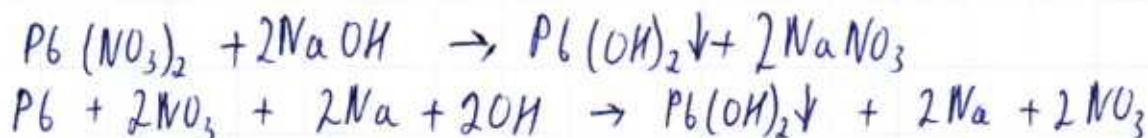
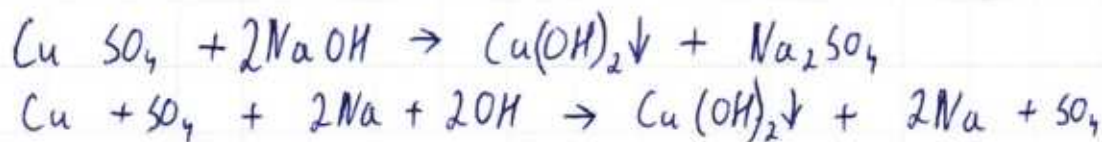
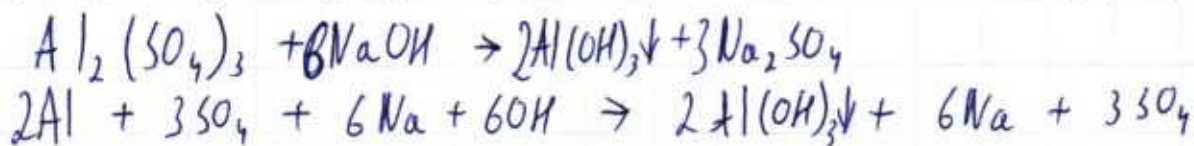
Ag_2S - қара $\downarrow$

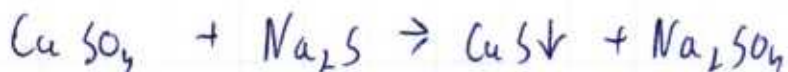
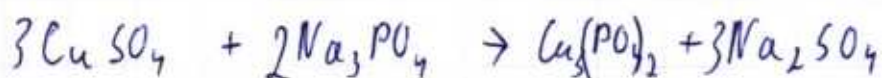
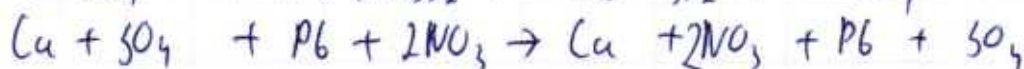
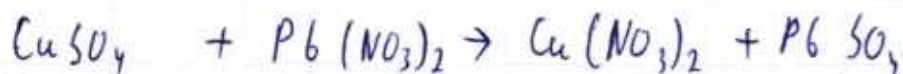
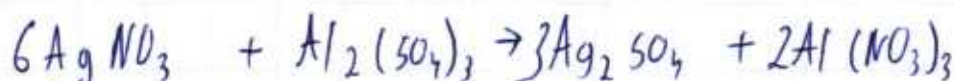
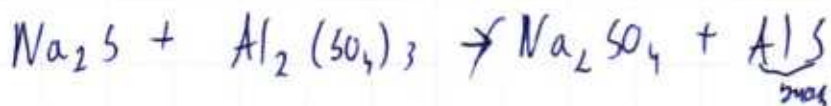
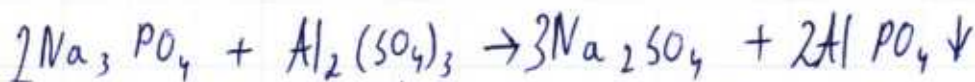
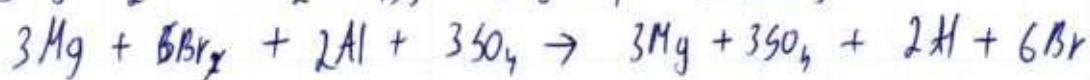
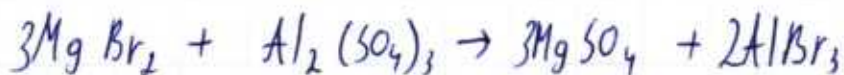
AgBr - сары $\downarrow$ (бозғалм)

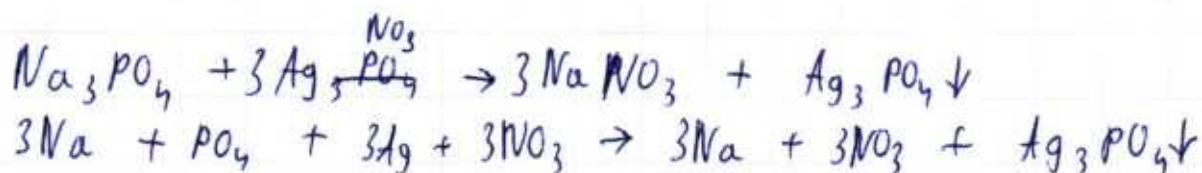
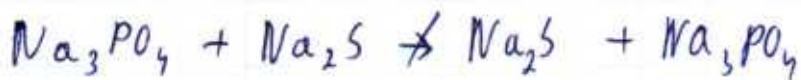
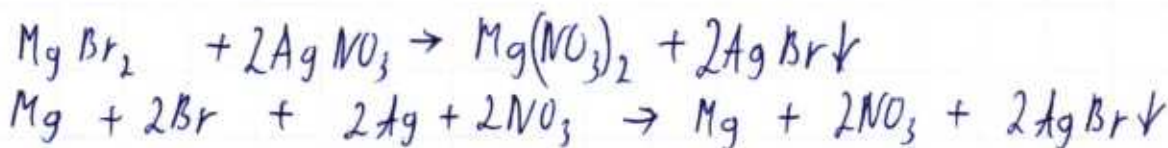
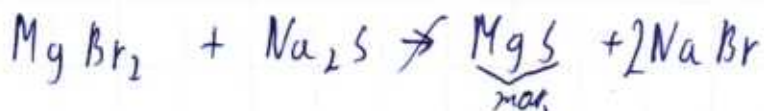
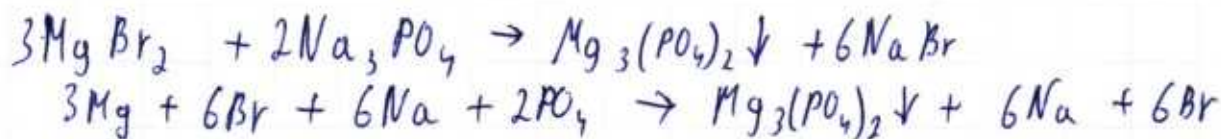
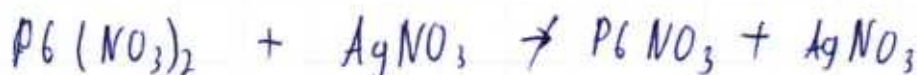
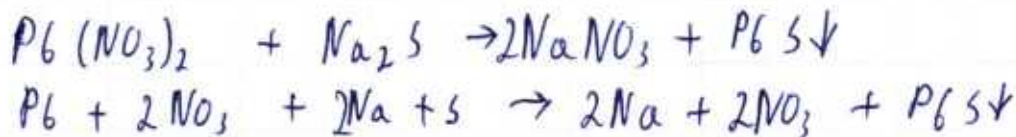
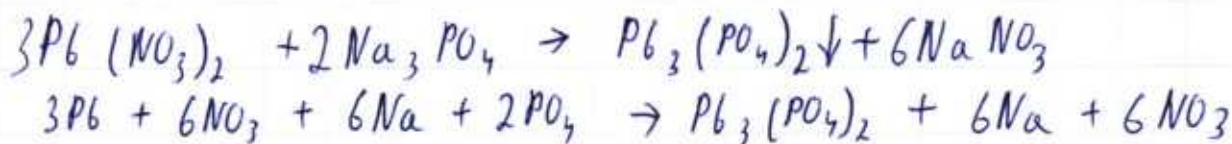
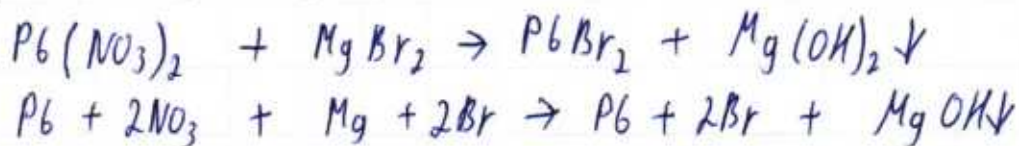
Ag_3PO_4 - ақ $\downarrow$

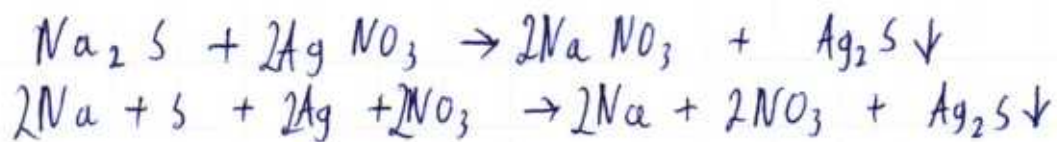
PbS - қара $\downarrow$

PbSO_4 - қара $\downarrow$

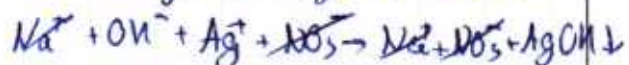
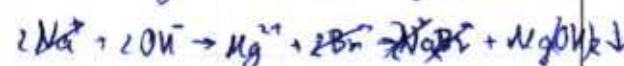
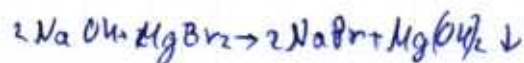
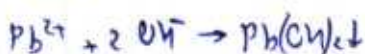
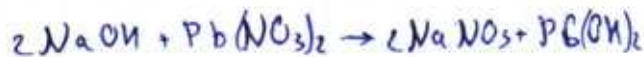
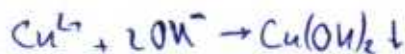
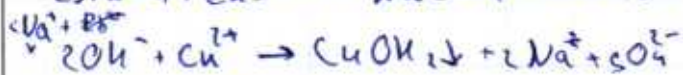
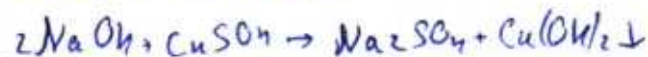
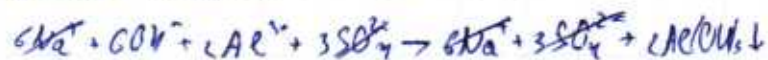
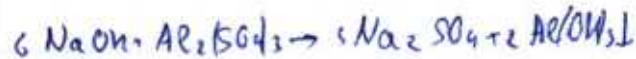


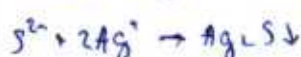
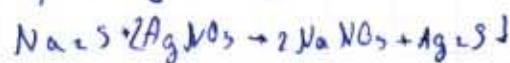
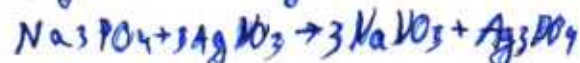
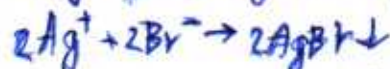
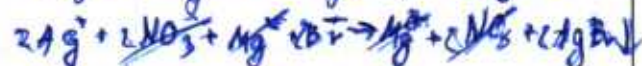
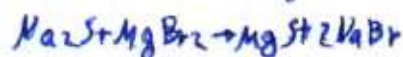
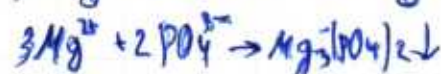
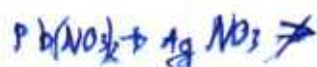
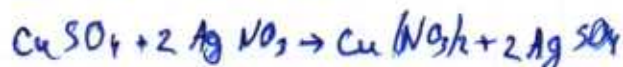
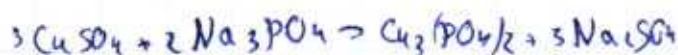
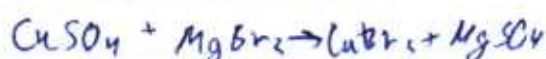
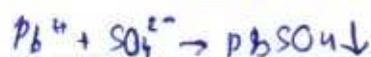
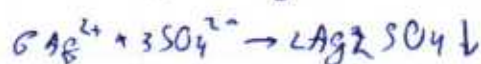
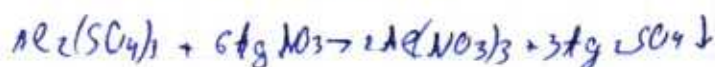
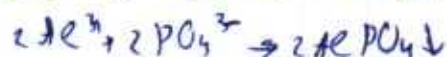
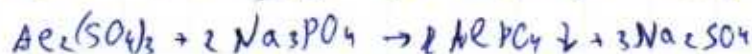
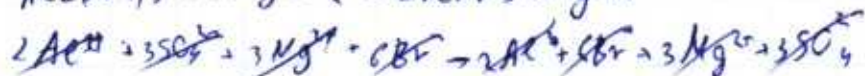
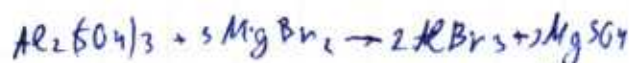
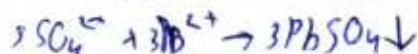
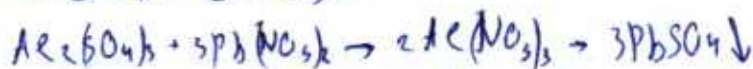
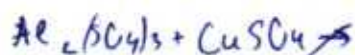




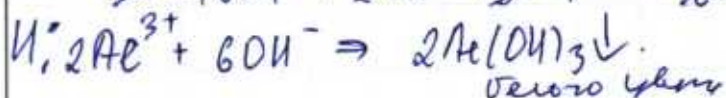
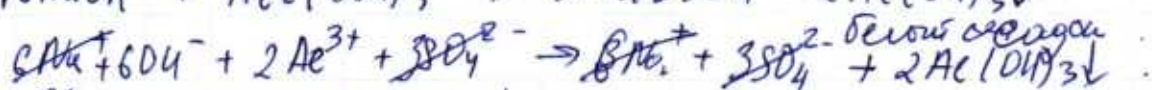


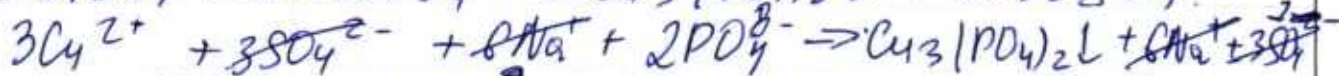
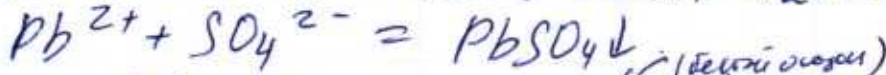
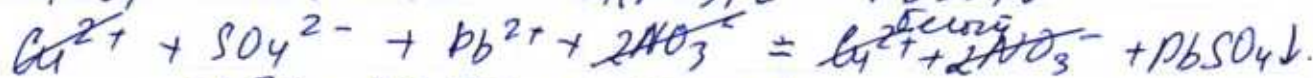
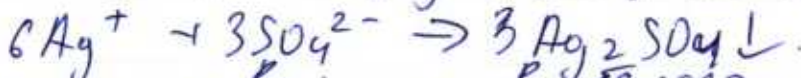
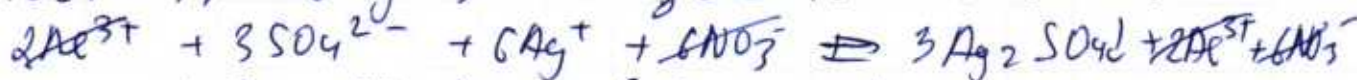
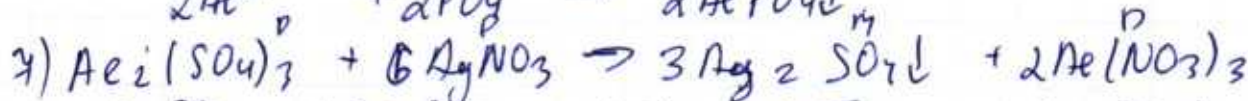
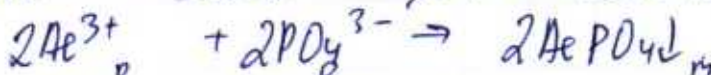
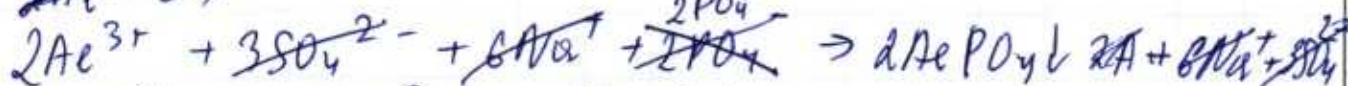
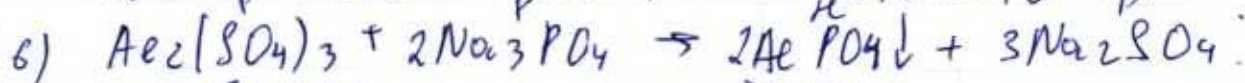
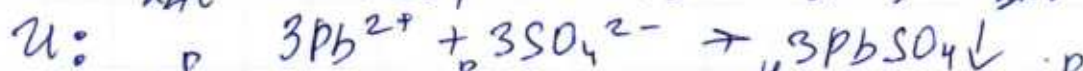
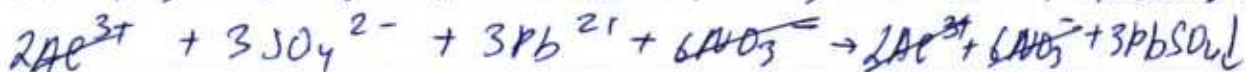
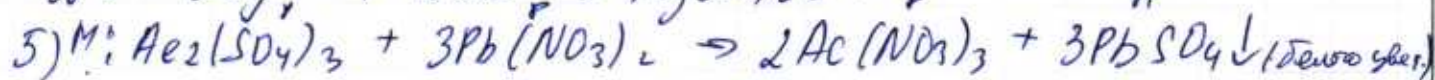
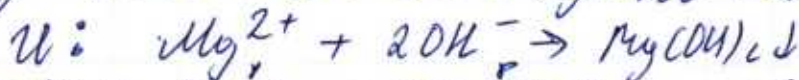
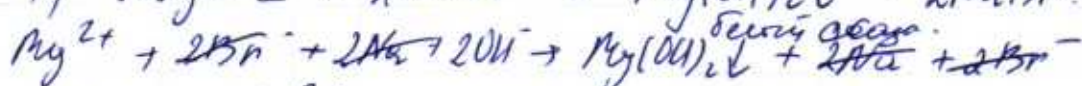
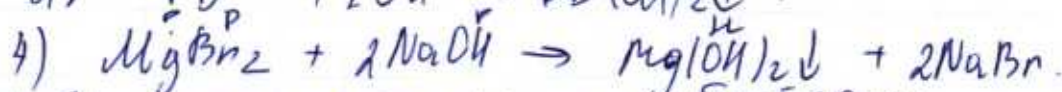
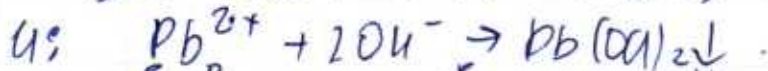
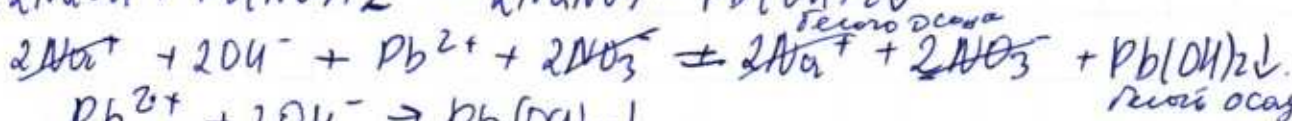
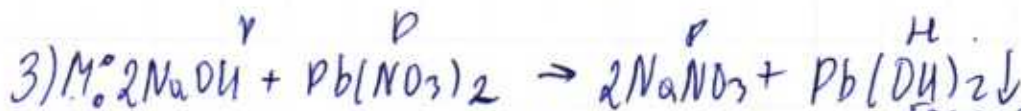
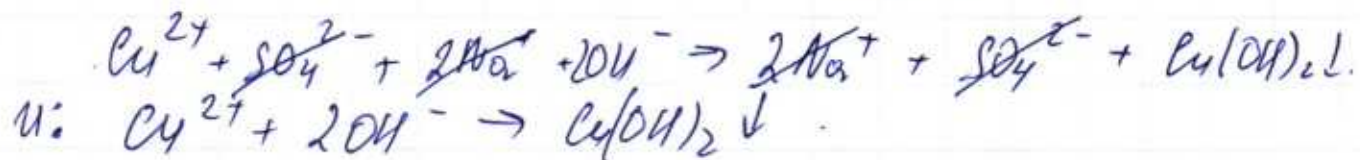
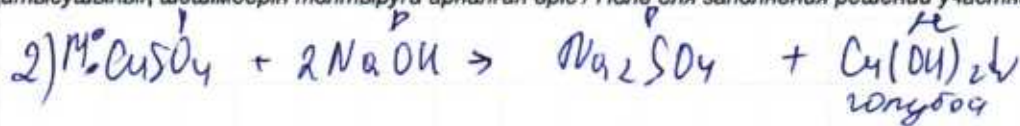
	NaOH	Al ₂ (SO ₄) ₃	CuSO ₄	Pb(NO ₃) ₂	MgBr ₂	Na ₃ PO ₄	Na ₂ S	AgNO ₃	
NaOH	—	Al(OH) ₃ ↓ кара н.	Cu(OH) ₂ ↓ кара н.	Pb(OH) ₂ ↓ кара н.	Mg(OH) ₂ ↓ кара н.	—	—	AgOH↓ кара н.	5↓
Al ₂ (SO ₄) ₃	Al(OH) ₃ ↓ кара н.	—	—	PbSO ₄ ↓ кара н.	—	AlPO ₄ ↓ кара н.	Al ₂ S ₃ ↓ кара н.	Ag ₂ SO ₄ ↓ кара н.	5↓
CuSO ₄	Cu(OH) ₂ ↓ кара н.	PbSO₄↓ кара н.	—	PbSO ₄ ↓ кара н.	CuBr ₂ ↓ кара н.	Cu ₃ (PO ₄) ₂ ↓ кара н.	CuS↓ кара-кара	Ag ₂ SO ₄ ↓ кара	6↓
Pb(NO ₃) ₂ MgBr₂	Pb(OH) ₂ ↓ кара н.	PbSO ₄ ↓ кара н.	PbSO ₄ ↓ кара	—	PbBr ₂ ↓ кара	Pb ₃ (PO ₄) ₂ ↓ кара	PbS↓ кара н.	—	6↓
MgBr ₂ Na₃PO₄	Mg(OH) ₂ ↓ кара н.	—	CuBr ₂ ↓ кара н.	PbBr ₂ ↓ кара	—	Mg ₃ (PO ₄) ₂ ↓ кара	—	AgBr↓ кара н.	5↓
Na ₃ PO ₄ Na₂S	—	AlPO ₄ ↓ кара н.	Cu ₃ (PO ₄) ₂ ↓ кара	Pb ₃ (PO ₄) ₂ ↓ кара	Mg ₃ (PO ₄) ₂ ↓ кара н.	—	—	Ag ₃ PO ₄ ↓ кара	5↓
Na ₂ S	—	Al ₂ S ₃ ↓ кара н.	CuS↓ кара н.	PbS↓ кара	—	—	—	Ag ₂ S↓ кара н.	4↓
AgNO ₃	AgOH↓ кара н.	Ag ₂ SO ₄ ↓ кара н.	Ag ₂ SO ₄ ↓ кара	—	AgBr↓ кара н.	Ag ₃ PO ₄ ↓ кара	Ag ₂ S↓ кара н.	—	6↓

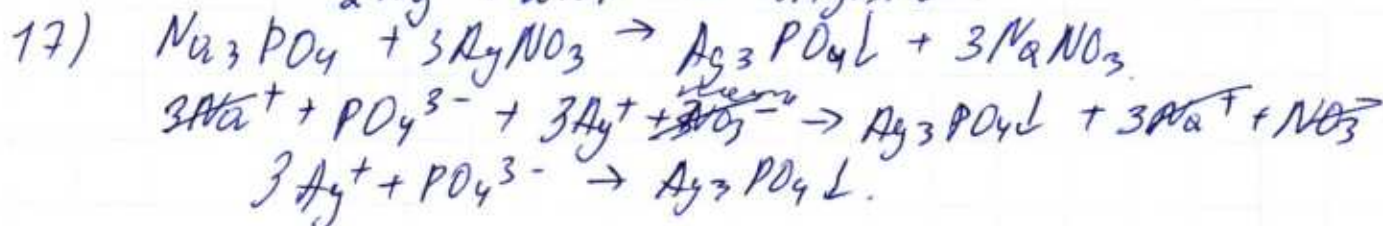
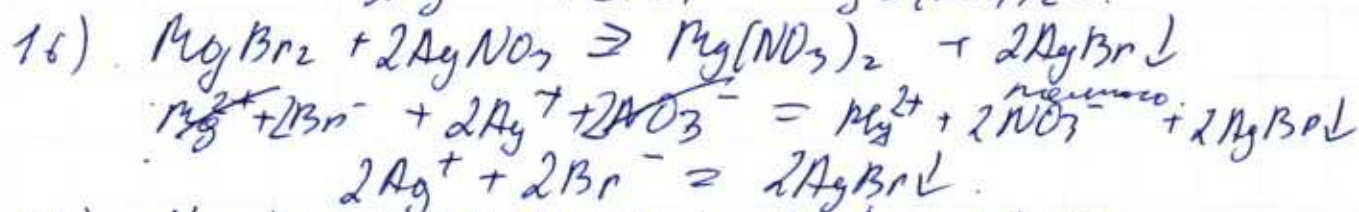
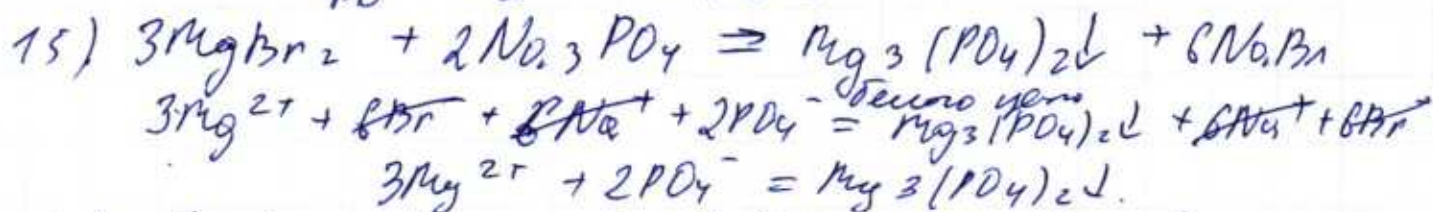
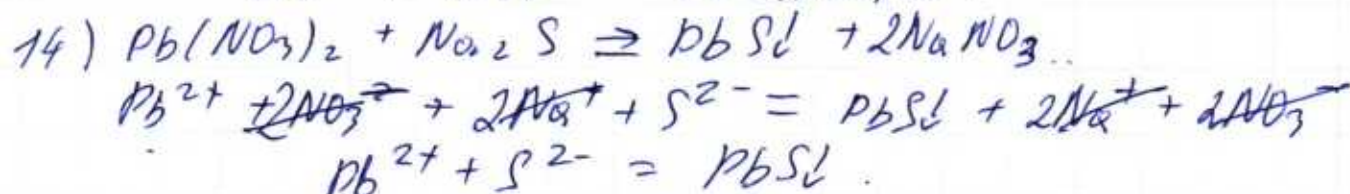
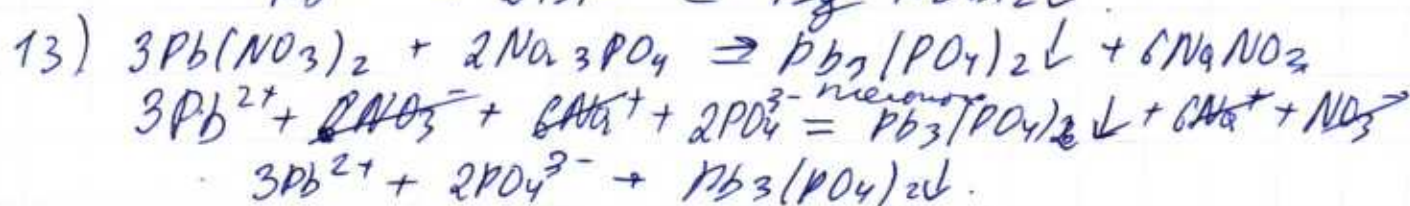
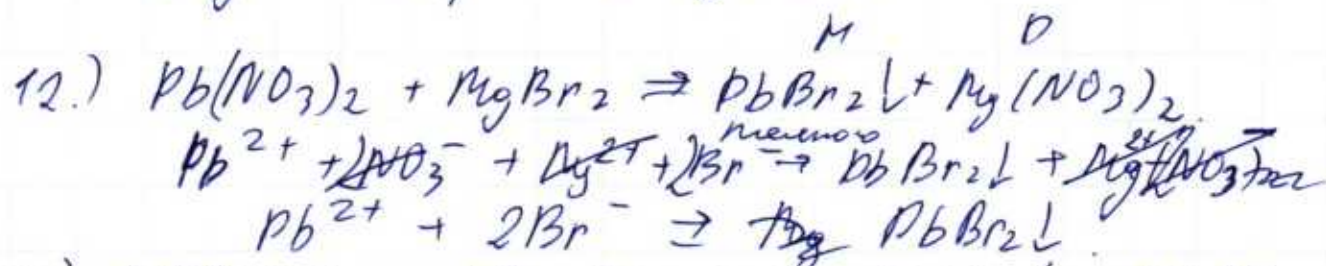
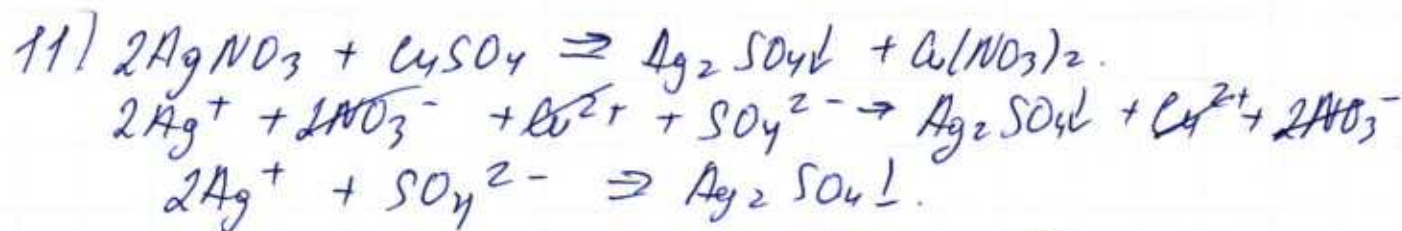
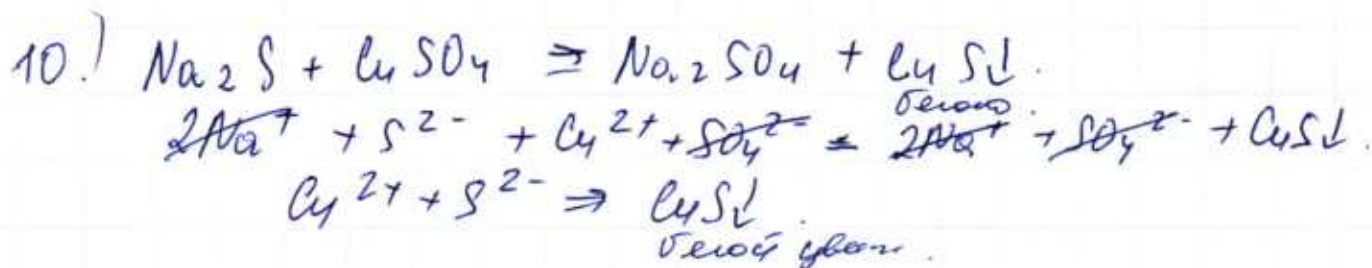


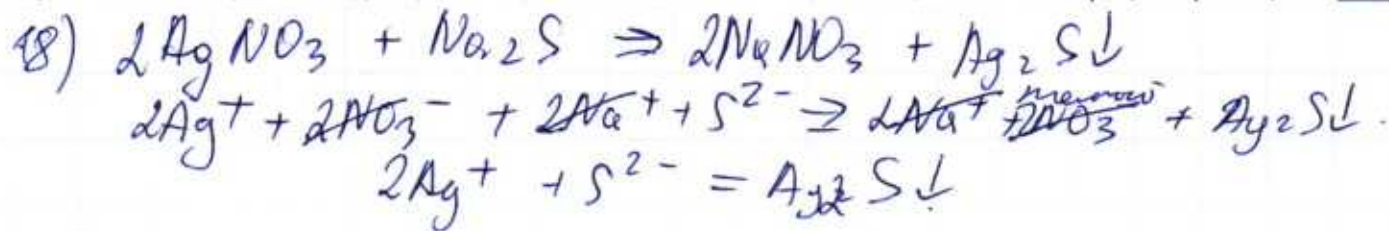


	NaOH	$\text{Al}_2(\text{SO}_4)_3$	CuSO_4	$\text{Pb}(\text{NO}_3)_2$	MgBr_2	Na_3PO_4	Na_2S	AgNO_3
NaOH	—	↓ белгі	↓ қою бояу	↓ мейлін	↓ белгі	— одинак.	—	не сұғы
$\text{Al}_2(\text{SO}_4)_3$	↓ белгі	—	— одинак.	↓ белгі	— (р-р)	↓	не сұғы	↓
CuSO_4	↓ қою бояу	—	—	↓ белгі	(р-р)	↓ белгі	↓ белгі	↓ белгі
$\text{Pb}(\text{NO}_3)_2$	↓ мейлін	↓ мейлін	↓ мейлін	—	↓ белгі	↓ белгі	↓ сұғы	—
MgBr_2	↓ белгі	(р-р)	(р-р)	↓ белгі	—	↓ белгі	— мелкі	↓ мейлін
Na_3PO_4	↓ белгі одинак.	↓ мейлін	↓ белгі	↓ белгі	↓ белгі	—	—	↓ мейлін
Na_2S	—	—	↓ белгі	↓ белгі	не сұғы	—	—	↓ мейлін
AgNO_3	не сұғы	↓ белгі	↓ белгі	—	↓ мейлін (мелкі)	↓ мейлін	↓ мейлін	—
Барлығы:	↓↓↓↓↓ (50 сұғы)	↓↓↓↓↓ (40 сұғы)	↓↓↓↓↓ (5 сұғы)	↓↓↓↓↓ (60 сұғы)	↓↓↓↓↓ (40 сұғы)	↓↓↓↓↓ (50 сұғы)	↓↓↓ (30 сұғы)	↓↓↓↓↓ (5 сұғы)









NaOH ; $\text{Al}_2(\text{SO}_4)_3$; CuSO_4 ; $\text{Pb}(\text{NO}_3)_2$; MgBr_2 ; Na_3PO_4 ; Na_2S ; AgNO_3

1) $6\text{NaOH} + \text{Al}_2(\text{SO}_4)_3 \rightarrow 3\text{Na}_2\text{SO}_4 + 2\text{Al}(\text{OH})_3 \downarrow$ ақ тұзін тұйыда, сілтінің көп

$6\text{Na}^+ + 6\text{OH}^- + 2\text{Al}^{3+} + 3\text{SO}_4^{2-} \rightarrow 6\text{Na}^+ + 3\text{SO}_4^{2-} + 2\text{Al}(\text{OH})_3 \downarrow$ мөлшерінде еріді

$6\text{OH}^- + 2\text{Al}^{3+} \rightarrow 2\text{Al}(\text{OH})_3 \downarrow$

2) $2\text{NaOH} + \text{CuSO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{Cu}(\text{OH})_2 \downarrow$ көк тұйыда

$2\text{Na}^+ + 2\text{OH}^- + \text{Cu}^{2+} + \text{SO}_4^{2-} \rightarrow 2\text{Na}^+ + \text{SO}_4^{2-} + \text{Cu}(\text{OH})_2 \downarrow$

$2\text{OH}^- + \text{Cu}^{2+} \rightarrow \text{Cu}(\text{OH})_2 \downarrow$

3) $2\text{NaOH} + \text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{NaNO}_3 + \text{Pb}(\text{OH})_2 \downarrow$

$2\text{Na}^+ + 2\text{OH}^- + \text{Pb}^{2+} + 2\text{NO}_3^- \rightarrow 2\text{Na}^+ + 2\text{NO}_3^- + \text{Pb}(\text{OH})_2 \downarrow$

$2\text{OH}^- + \text{Pb}^{2+} \rightarrow \text{Pb}(\text{OH})_2 \downarrow$

4) $2\text{NaOH} + \text{MgBr}_2 \rightarrow 2\text{NaBr} + \text{Mg}(\text{OH})_2 \downarrow$ ақ тұйыда

$2\text{Na}^+ + 2\text{OH}^- + \text{Mg}^{2+} + 2\text{Br}^- \rightarrow 2\text{Na}^+ + 2\text{Br}^- + \text{Mg}(\text{OH})_2 \downarrow$

$\text{Mg}^{2+} + 2\text{OH}^- \rightarrow \text{Mg}(\text{OH})_2 \downarrow$

5) $\text{Al}_2(\text{SO}_4)_3 + 2\text{Na}_3\text{PO}_4 \rightarrow 2\text{AlPO}_4 \downarrow + 3\text{Na}_2\text{SO}_4$

$2\text{Al}^{3+} + 3\text{SO}_4^{2-} + 6\text{Na}^+ + 2\text{PO}_4^{3-} \rightarrow 2\text{AlPO}_4 \downarrow + 6\text{Na}^+ + 3\text{SO}_4^{2-}$

$2\text{Al}^{3+} + 2\text{PO}_4^{3-} \rightarrow 2\text{AlPO}_4 \downarrow$

6) $3\text{CuSO}_4 + 2\text{Na}_3\text{PO}_4 \rightarrow 3\text{Na}_2\text{SO}_4 + \text{Cu}_3(\text{PO}_4)_2 \downarrow$

$3\text{Cu}^{2+} + 3\text{SO}_4^{2-} + 6\text{Na}^+ + 2\text{PO}_4^{3-} \rightarrow 6\text{Na}^+ + 3\text{SO}_4^{2-} + \text{Cu}_3(\text{PO}_4)_2 \downarrow$

$3\text{Cu}^{2+} + 2\text{PO}_4^{3-} \rightarrow \text{Cu}_3(\text{PO}_4)_2 \downarrow$

7) $\text{CuSO}_4 + \text{Na}_2\text{S} \rightarrow \text{CuS} \downarrow + \text{Na}_2\text{SO}_4$ қара тұйыда

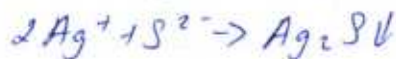
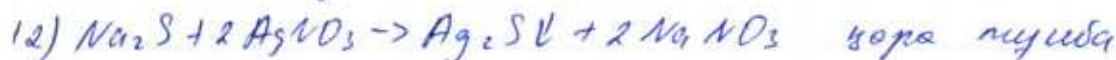
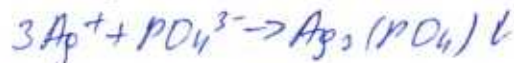
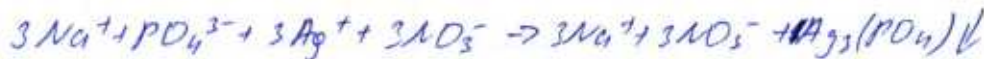
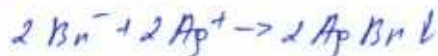
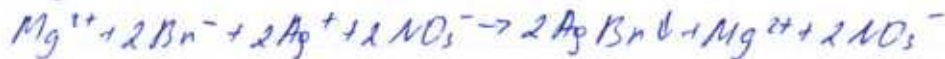
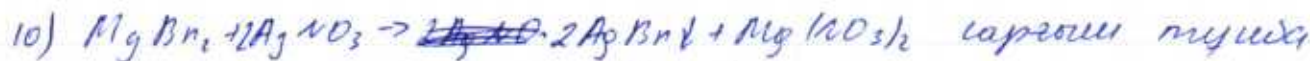
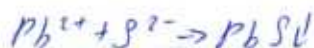
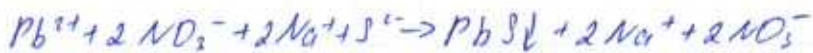
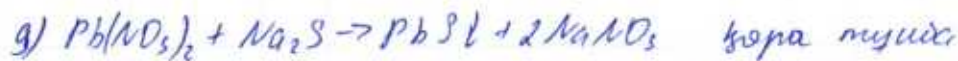
$\text{Cu}^{2+} + \text{SO}_4^{2-} + 2\text{Na}^+ + \text{S}^{2-} \rightarrow \text{CuS} \downarrow + 2\text{Na}^+ + \text{SO}_4^{2-}$

$\text{Cu}^{2+} + \text{S}^{2-} \rightarrow \text{CuS} \downarrow$

8) $3\text{Pb}(\text{NO}_3)_2 + 2\text{Na}_3\text{PO}_4 \rightarrow 6\text{NaNO}_3 + \text{Pb}_3(\text{PO}_4)_2 \downarrow$

$3\text{Pb}^{2+} + 6\text{NO}_3^- + 6\text{Na}^+ + 2\text{PO}_4^{3-} \rightarrow 6\text{Na}^+ + 6\text{NO}_3^- + \text{Pb}_3(\text{PO}_4)_2 \downarrow$

$3\text{Pb}^{2+} + 2\text{PO}_4^{3-} \rightarrow \text{Pb}_3(\text{PO}_4)_2 \downarrow$



$CuSO_4 \downarrow$ көк түседі

$NO_2 \uparrow$ қызыл түспелі газ.

