

VI A Grupās elementi

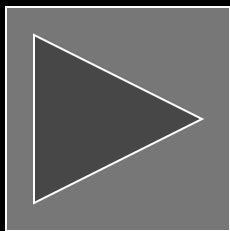
Preiļu Valsts ģimnāzija

Ķīmija

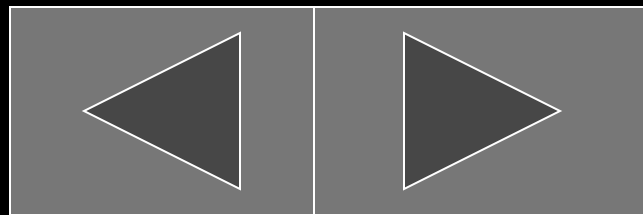
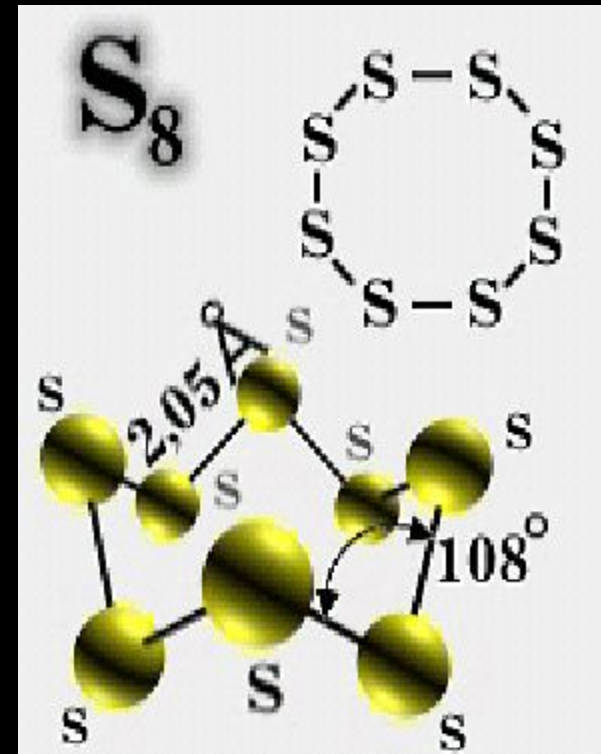
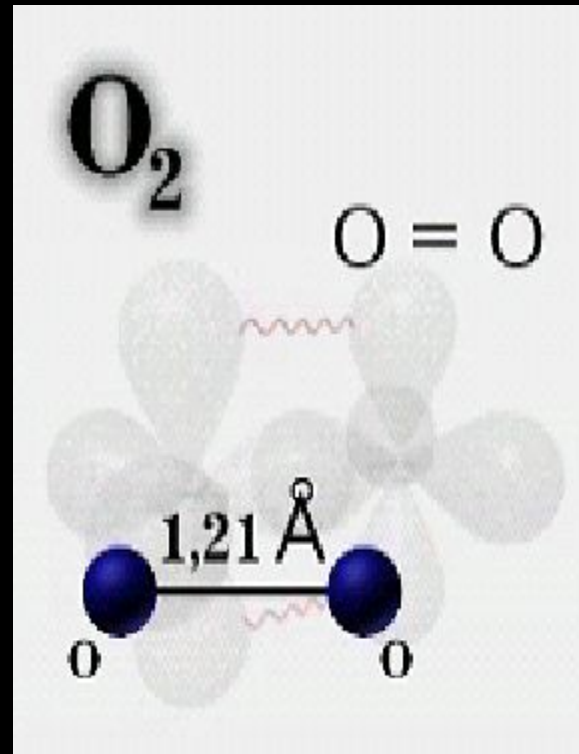
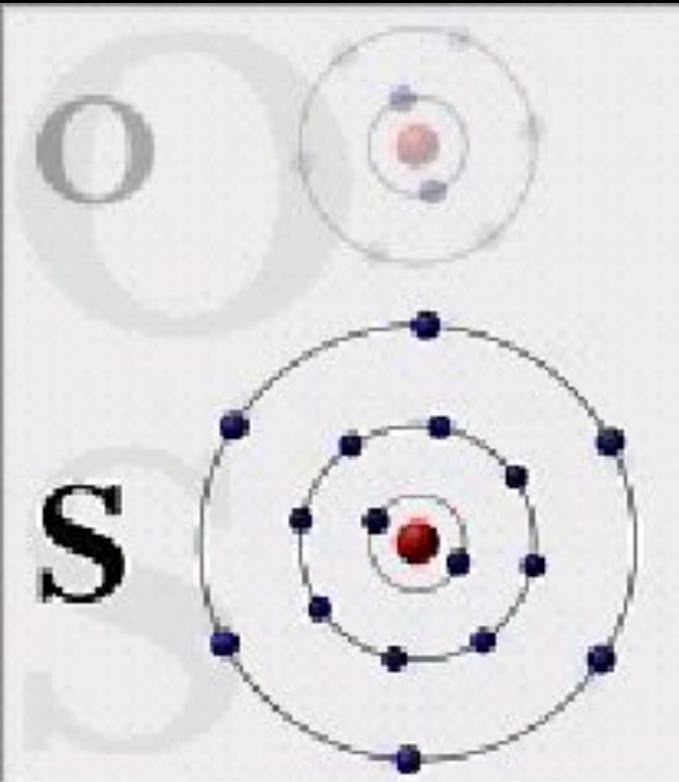
Sk. Francis Livmanis



V	VI	(H)
7 14,00674 5,07 0,012 N АЗОТ	8 15,9994 3,50 0,045 O КИСЛОРОД	9 15,9984032 4,10 0,040 F ФТОР
15 30,973762 1,10 0,092 P ФОСФОР	16 32,066 2,60 0,081 S СЕРА	17 35,453 2,23 0,072 Cl ХЛОР
23 50,9415 V ВАНАДИЙ	24 51,9961 Cr ХРОМ	25 54,93805 Mn МАРГАНЕЦ
33 74,92159 2,30 0,190 As МЫШЬЯК	34 78,96 2,48 0,092 Se СЕЛЕН	35 79,904 2,34 0,085 Br БРОМ
41 92,90638 Nb НИОБИЙ	42 95,94 Mo МОЛИБДЕН	43 97,9072 Tc ТЕХНЕЦИЙ
51 121,75 1,83 0,119 Sb СУРЬМА	52 127,60 2,01 0,111 Te ТЕЛУР	53 126,90447 2,31 0,105 I ИОД
73 180,9479 Ta ТАНТАЛ	74 183,85 W ВОЛЬФРАМ	75 186,207 Re РЕНИЙ
83 208,98037 1,87 0,138 Bi ВИСМУТ	84 208,9824 Po ПОЛОНИЙ	85 209,987 1,90 0,115 At АСТАТ
105 262,114 (Ns) НИЛЬСБОРЬИЙ	106 263,118 (Nh) НИХИЛИЙ	107 262,12 (Nh) НИХИЛИЙ



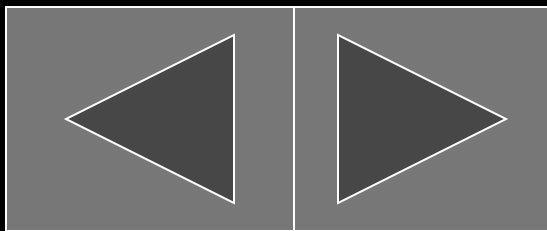
Atoma uzbūve



Fizikālās īpašības

¹⁶ O	99,76%
¹⁷ O	0,04%
¹⁸ O	0,2%

Elementa simbols	O	S	Se	Te	Po	
Kodola lādiņš	8	16	34	52	84	
Blīvums g/cm ³	1,43 g/l	2.07	4.79	6.25	9.32	
t ⁰ kuš.	°C	-218.8	119.3	217	449.8	254
	°K	54.4	392.5	490.2	723.0	527.2
t ⁰ vār.	°C	-183.0	444.6	685	990	962
	°K	90.2	717.8	958.2	1263.2	1235.2



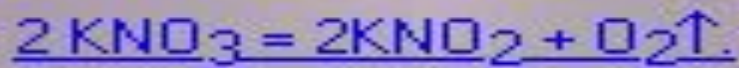
Oksidēšanās pakāpes

O^{-2}	H_2O, CaO, CO, N_2O
O^{-1}	H_2O_2, BaO_2, KHO_2
O^0	O, O_2, O_3
O^{+1}	F_2O_2
O^{+2}	F_2O
S^{-2}	H_2S, FeS
S^{-1}	H_2S_2, FeS_2
S^0	S, S_2, S_8
S^{+4}	SO_2, H_2SO_3, K_2SO_3
S^{+6}	$SO_3, SO_2Cl_2, H_2SO_4, K_2SO_4, KHSO_4, Na_2S_2O_7$

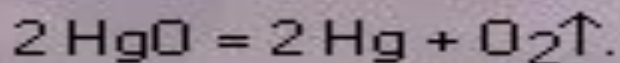


Skābekļa iegūšana

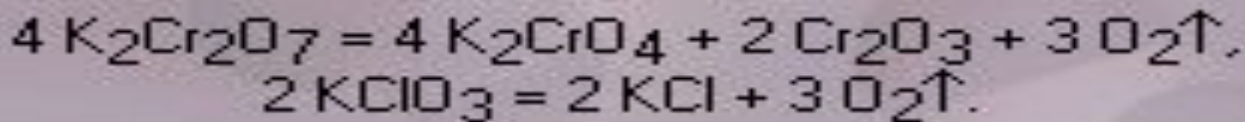
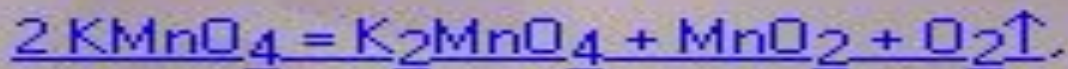
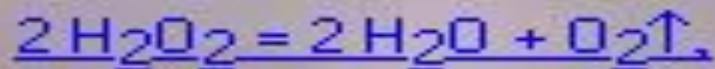
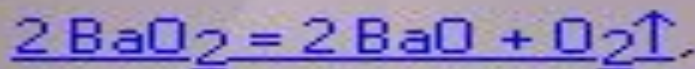
Zviedru ķīmiķis K.Šēle ap 1770. gadu ieguva molekulāru skābekli, karsējot salpetri.



1774. gadā angļu ķīmiķis Dž.Pristli ieguva skābekli karsējot HgO

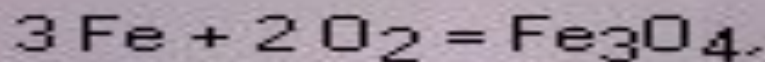
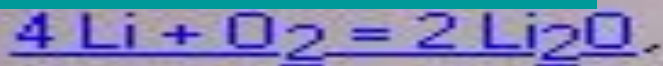


Laboratorijas apstākļos skābekli parasti iegūst:

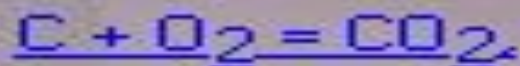
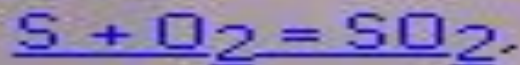
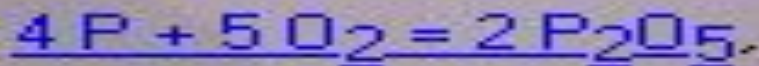


Skābekļa ķīmiskās īpašības

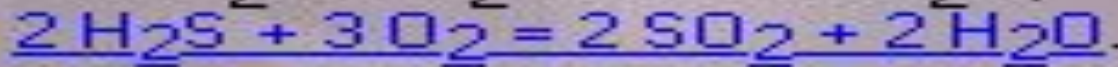
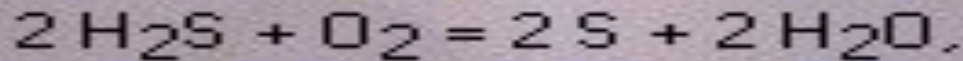
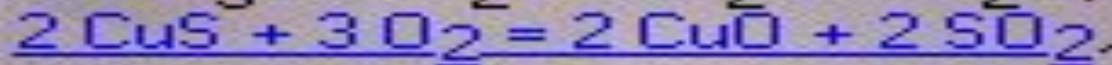
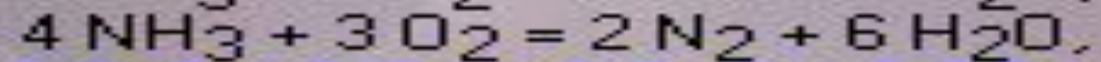
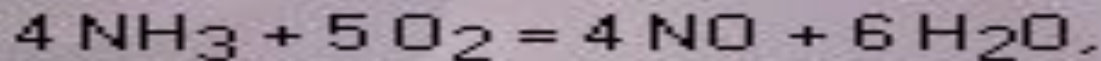
Reaģē ar metāliem



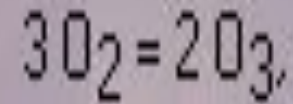
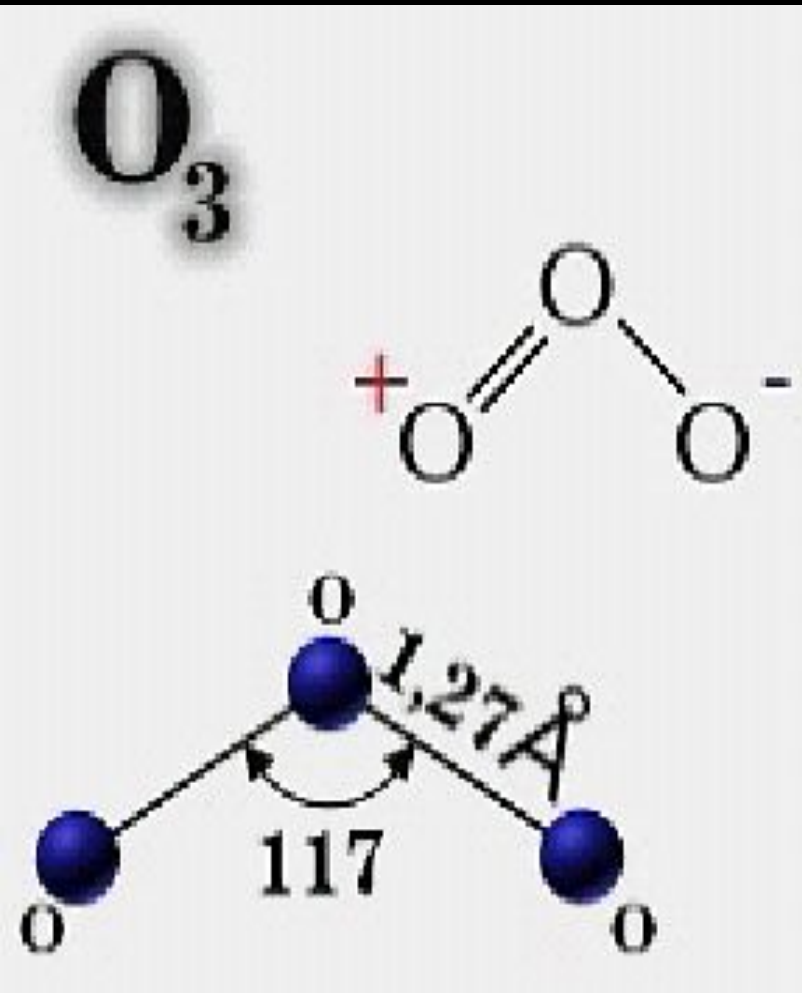
Reaģē ar nemetāliem



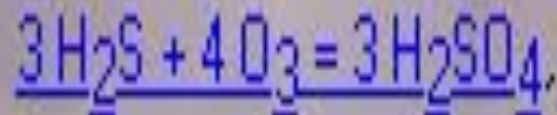
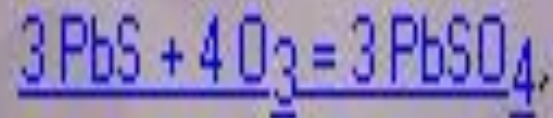
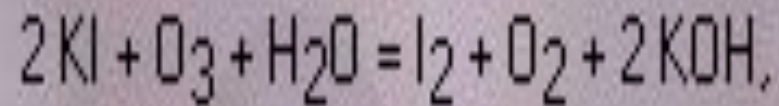
Reaģē ar saliktām vielām



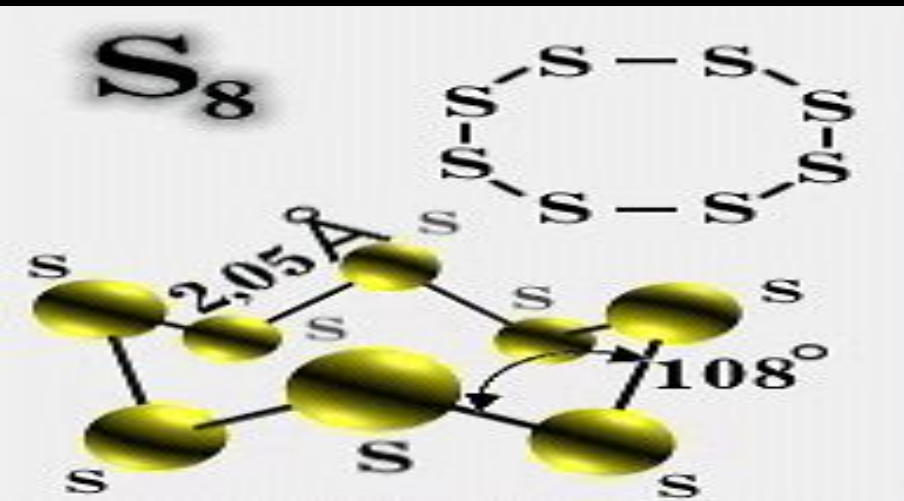
Ozons



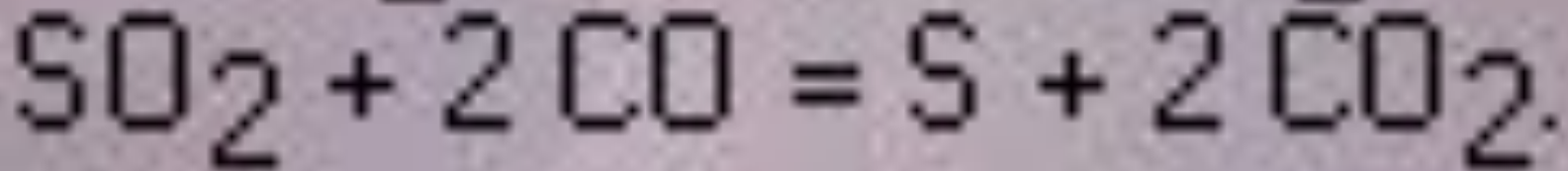
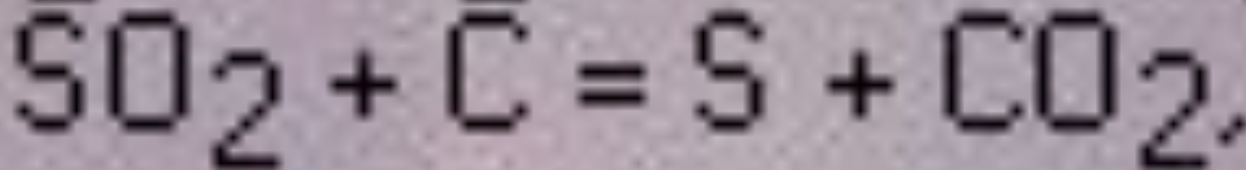
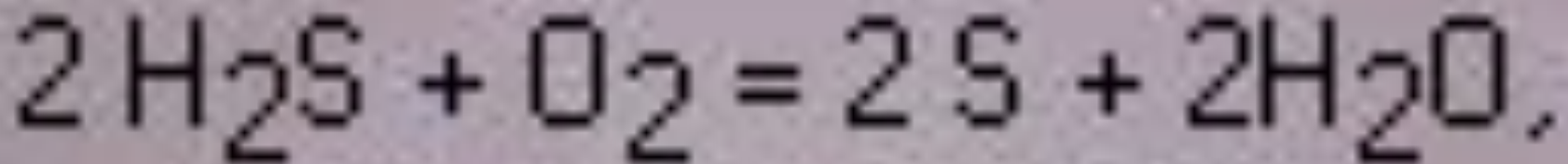
Ozons ir vēl spēcīgāks oksidētājs nekā skābeklis



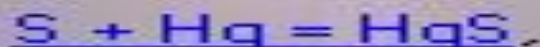
Sērs



Sēra iegūšana un tā
alotropiskie veidi.



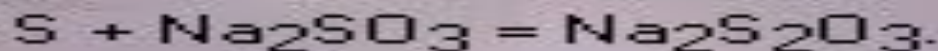
Sēra ķīmiskās īpašības



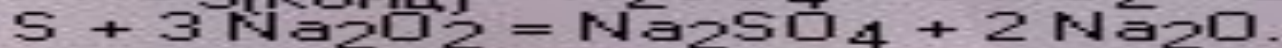
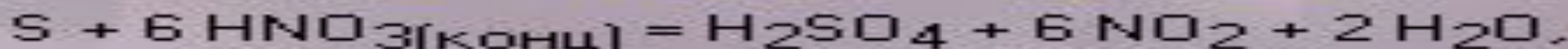
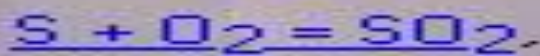
Reaģē ar metāliem un nemetāliem



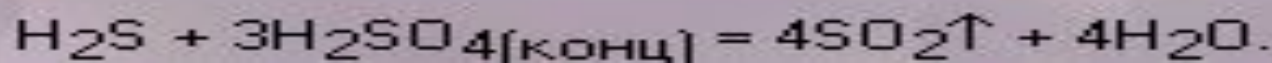
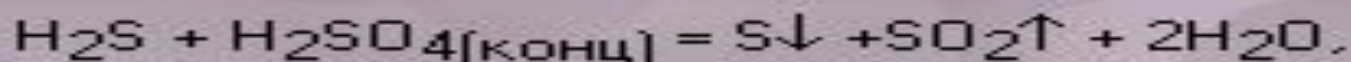
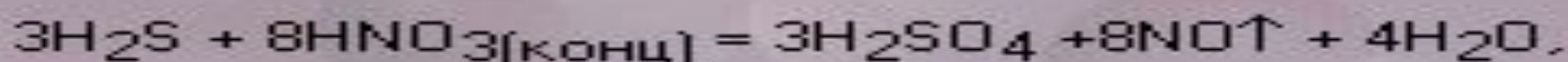
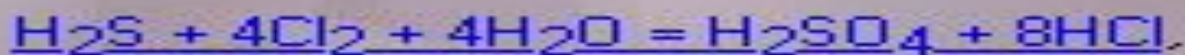
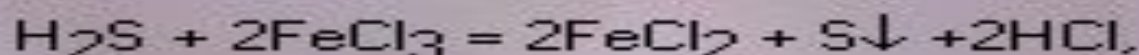
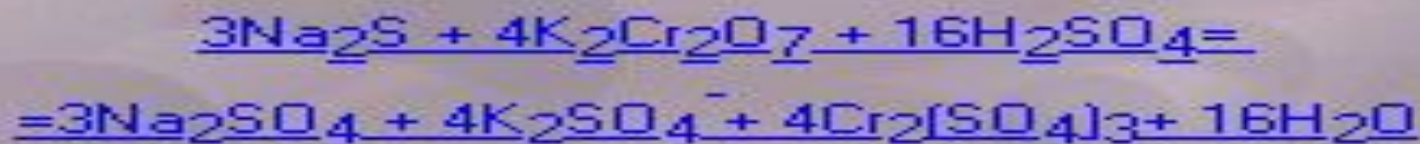
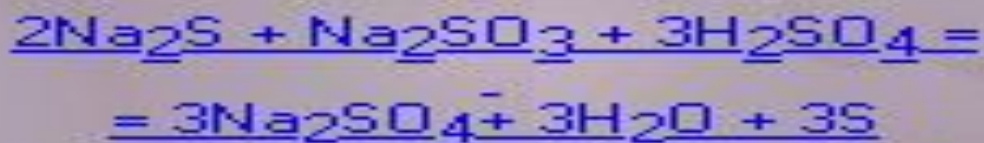
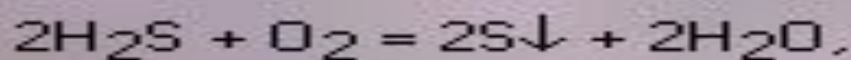
Šķīst koncentrētā nātrija sulfīta šķīdumā



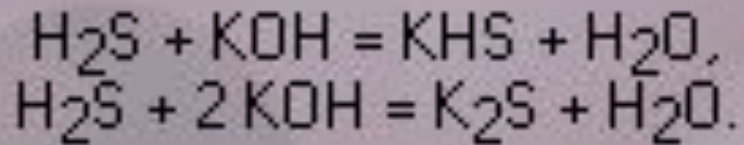
Ar spēcīgiem oksidētājiem sērs uzrāda reducētāja īpašības



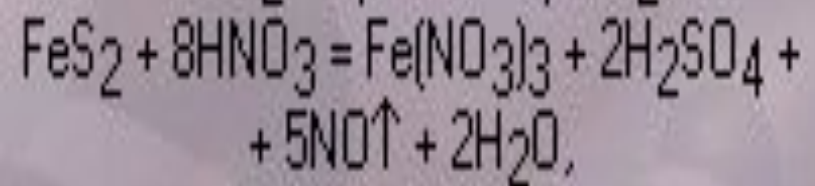
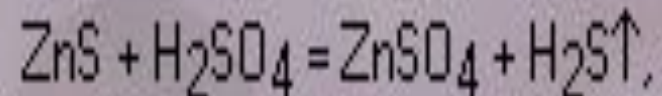
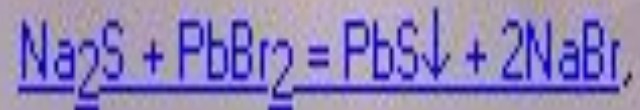
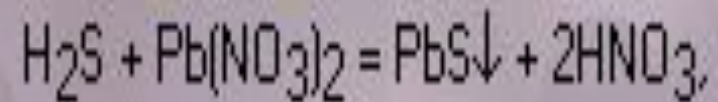
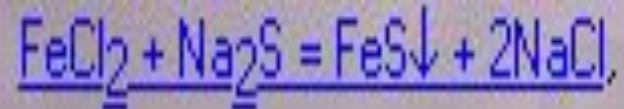
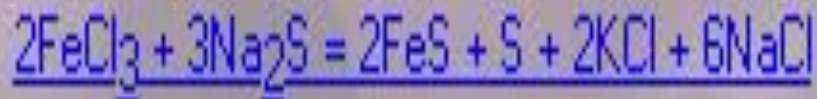
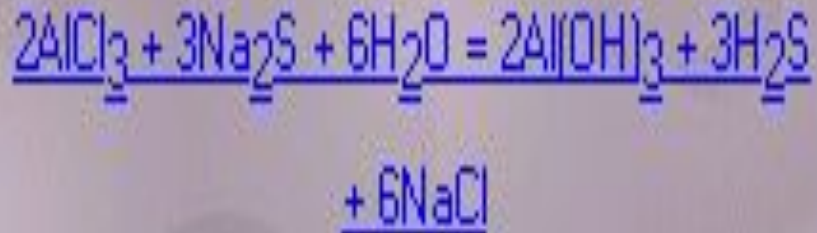
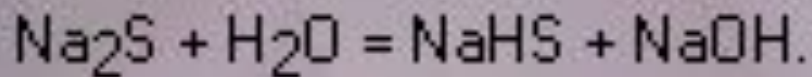
Sērūdeņradis



Sulfīdi

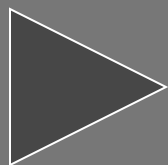
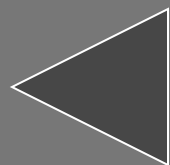
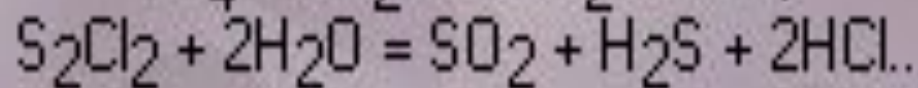
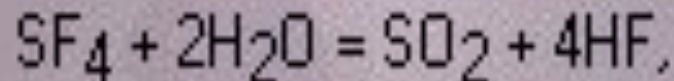
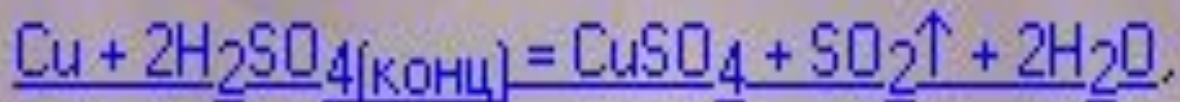
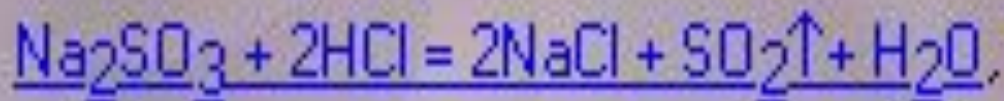
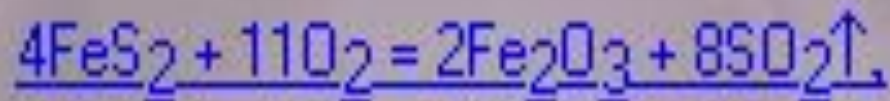
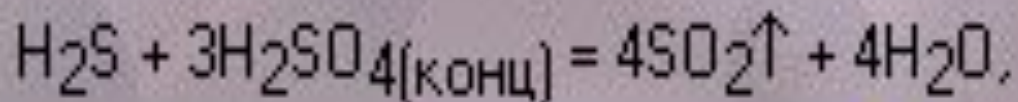
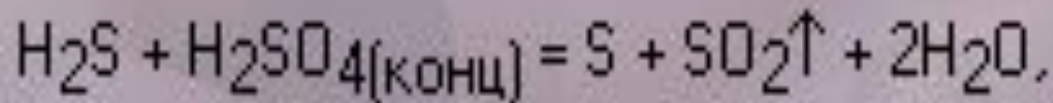
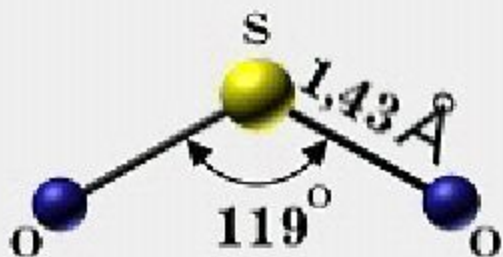
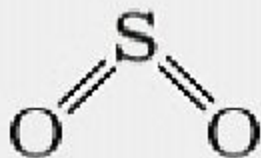


Sārnu metālu sulfīdu ūdens šķīdumi ir stipri hidrolizēti, bet sārmzemju MeS slikti šķīst ūdenī.

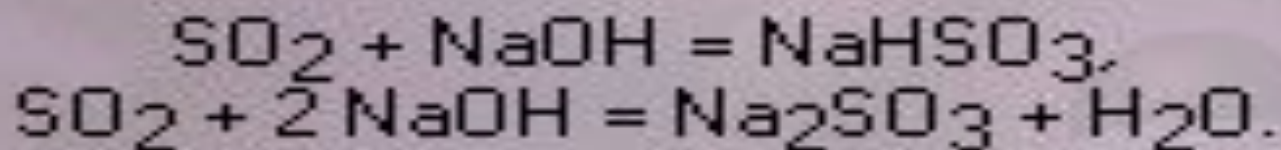


Sēra dioksīda iegūšana

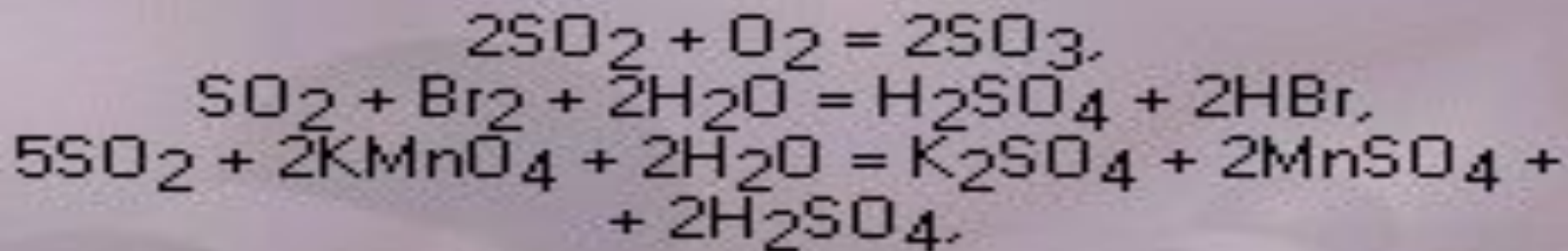
SO₂



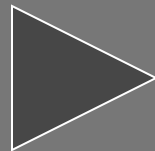
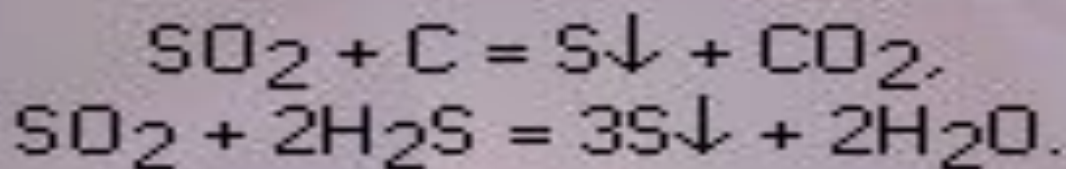
SO₂ ķīmiskās īpašības



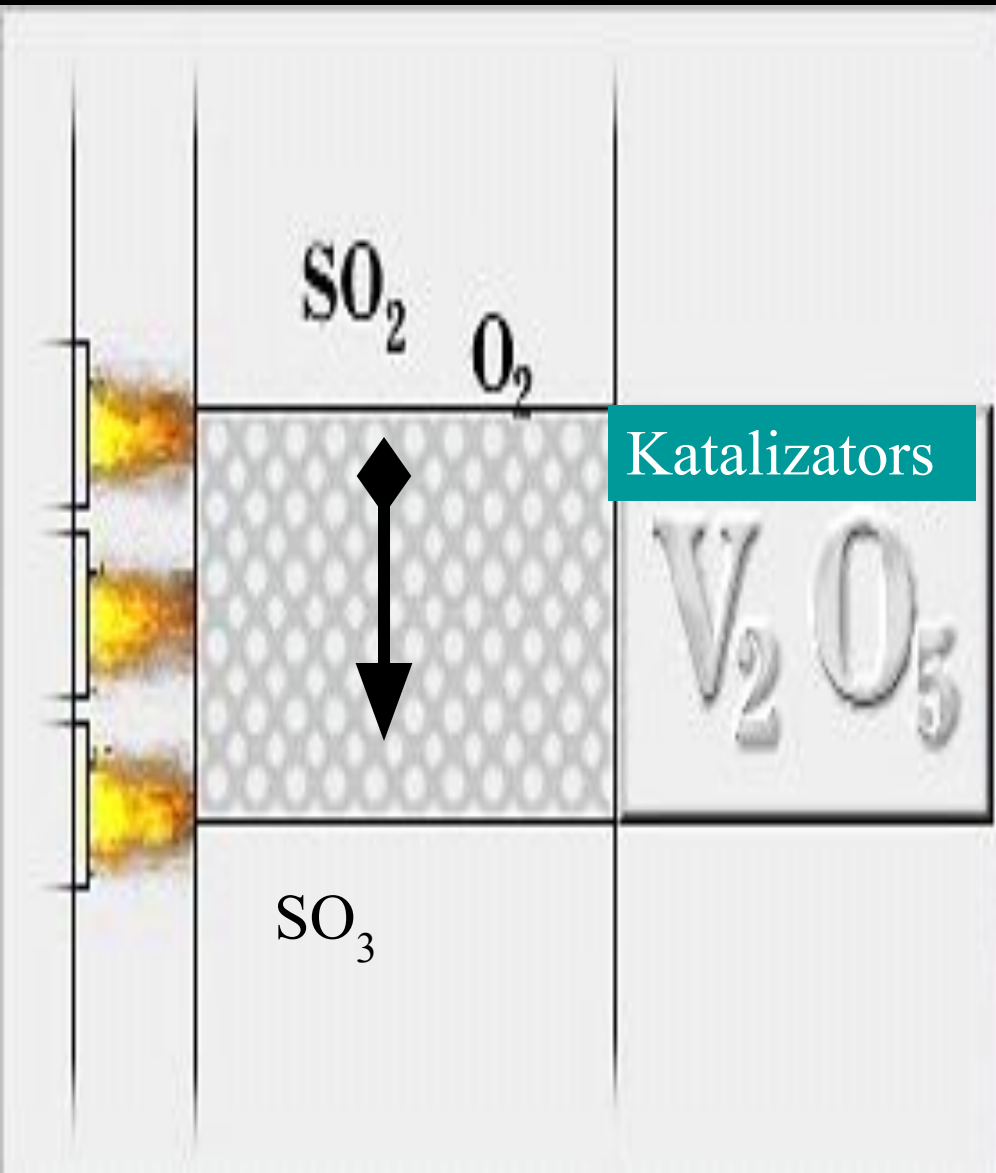
Sēra dioksīds reakcijās var būt spēcīgs reducētājs



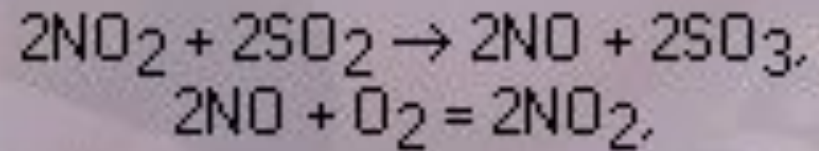
Tas var būt arī oksidētājs



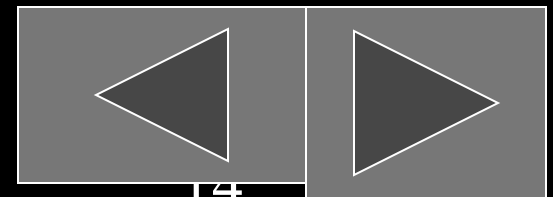
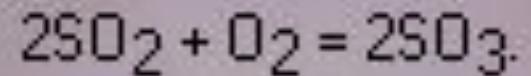
Sēra dioksīda oksidēšana



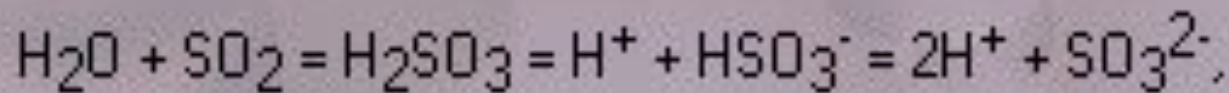
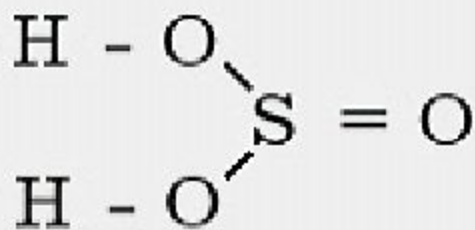
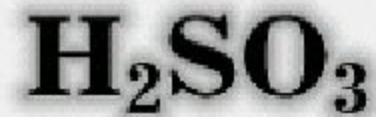
Agrāk sēra dioksīdu oksidēja par sēra trioksīdu ar NO₂



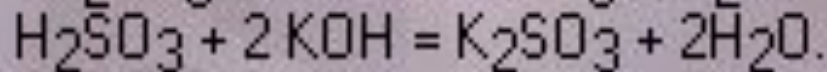
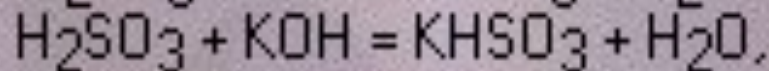
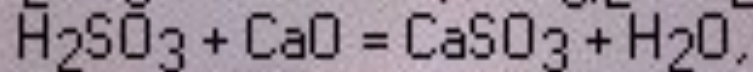
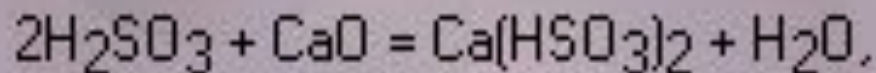
Rezultātā



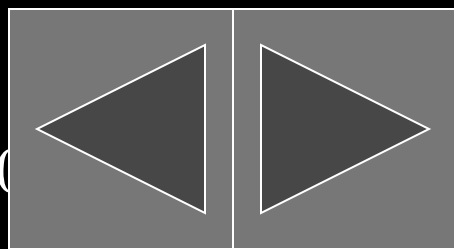
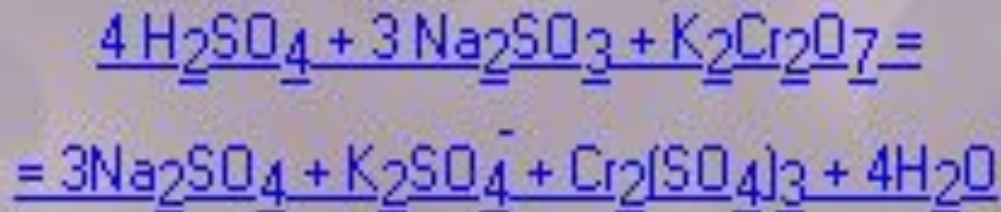
Sērpaskābe un tās sāļi



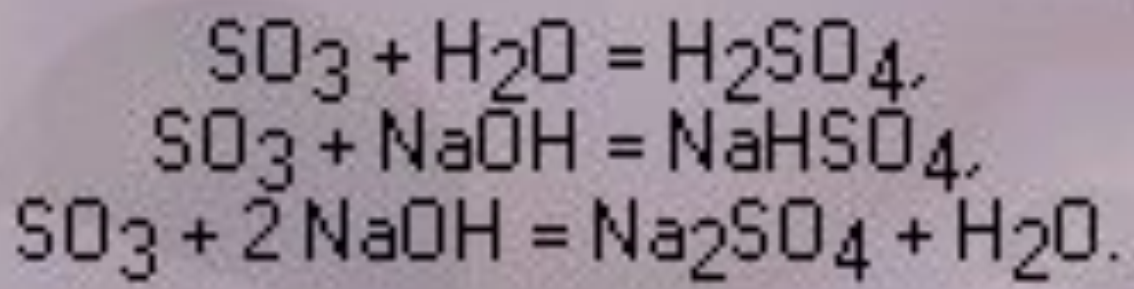
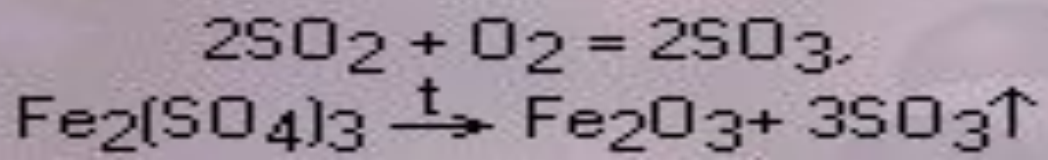
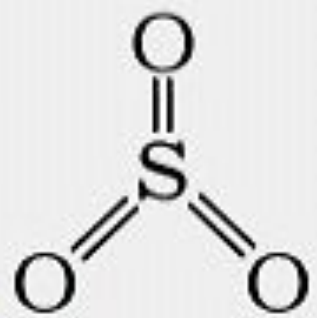
Reaģē ar bāziskajiem oksīdiem un bāzēm



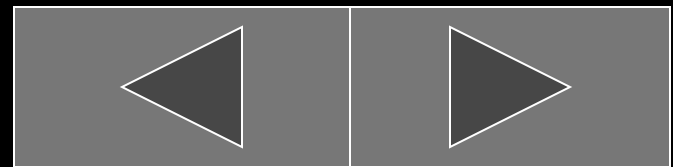
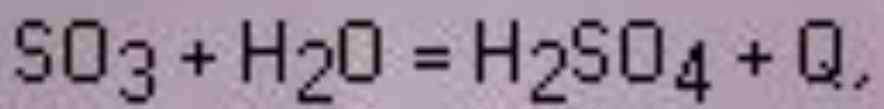
Sulfīti ir spēcīgi reducētāji



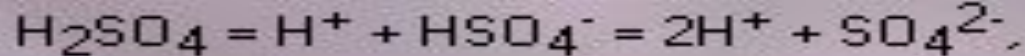
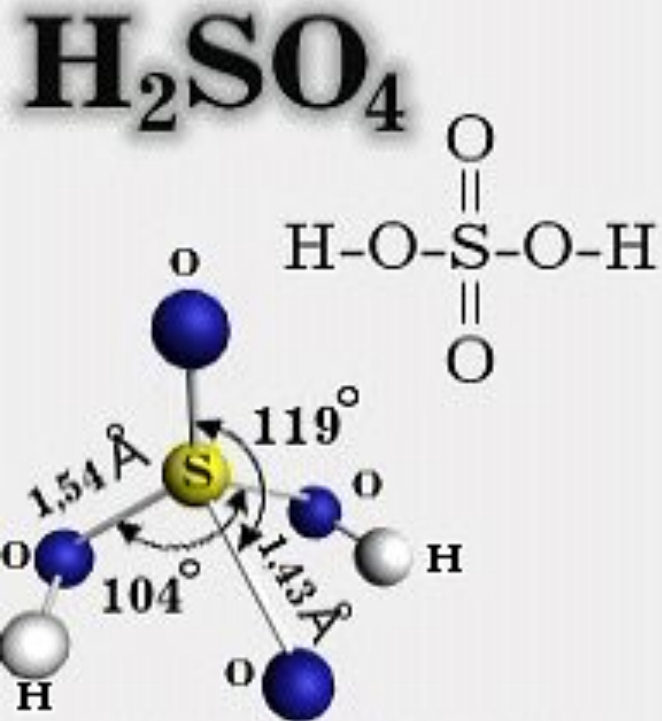
Sēra trioksīds



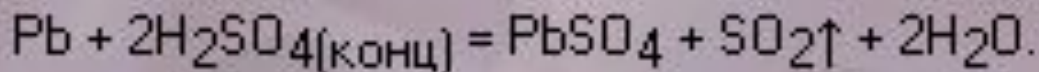
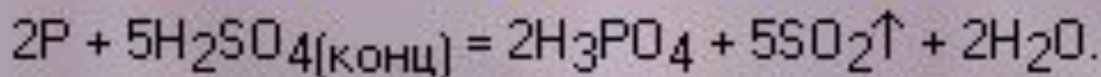
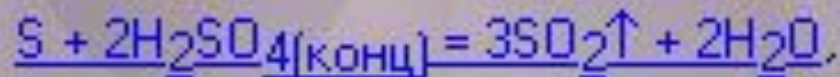
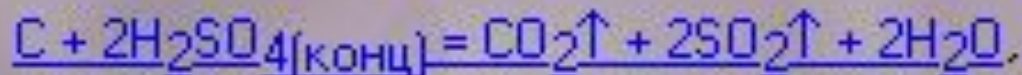
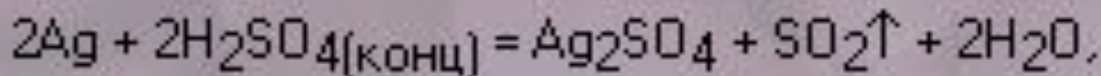
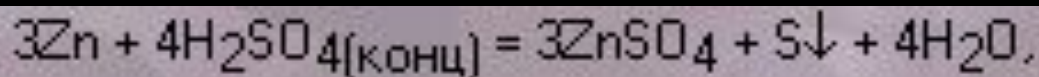
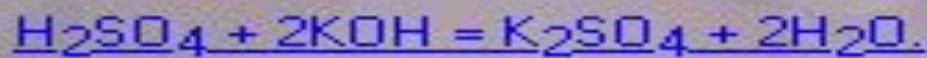
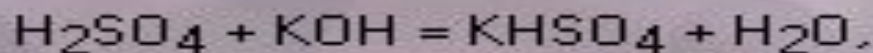
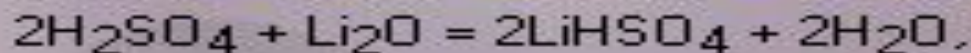
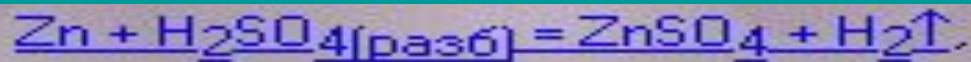
Reaģējot ar ūdeni veido sērskābi



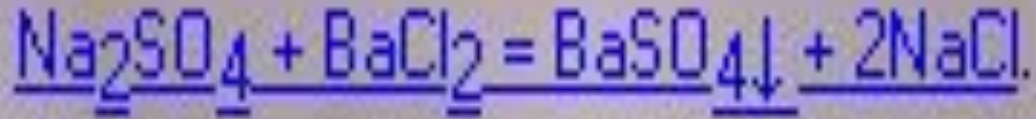
Sērskābe



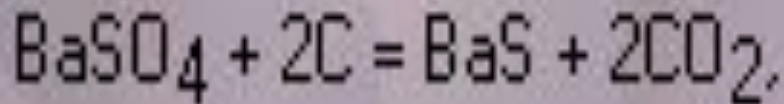
Reaģē ar metāliem, bāziskajiem oksīdiem un hidroksīdiem



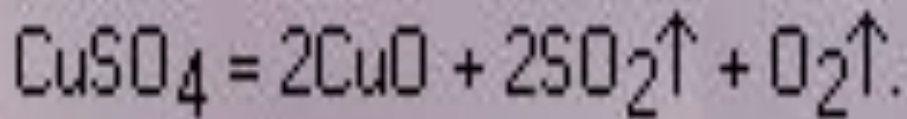
Sērskābes sāļi



Karsējot oksidētāju klātbūtnē var notikt reakcija



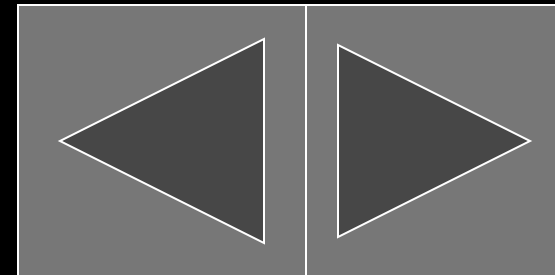
Sulfātu sadalīšanās



09/03/2023



Sulfātjona
pierādīšana



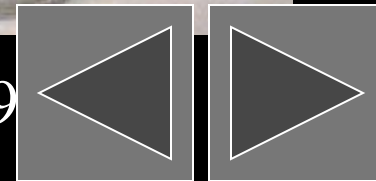
Eksperimenti



Attēlos redzamas Al un Zn reakcijas ar sēru. Uzrakstiet reakciju vienādojumus! Kas šajās reakcijās ir oksidētājs un kas reducētājs?



Uzrakstiet reakcijas vienādojumu!



Eksperimenti



Uzrakstiet reakciju
vienādojumus cukura
reakcijai ar sērskābi un
pārejos!

