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# [一、无机化学方程式](#目录表)

## [A](#目录表)

[Ag](#目录表" \o "返回目录)

Ag+2HNO3(浓)＝AgNO3+NO2↑+H2O

2AgCl＝2Ag + Cl2↑(见光或受热)

AgNO3 + NaCl ＝ AgCl↓ + NaNO3      AgNO3 + NaBr＝ AgBr↓ + NaNO3

AgNO3 + NaI ＝ AgI↓ + NaNO3

2AgNO3+H2S＝Ag2S↓+2HNO3

Ag3PO4+3HNO3＝H3PO4+3AgNO3

### [Al](#目录表" \o "返回目录)

#### [Al](#目录表)

Al+3O22Al2O3(纯氧) 2Al+3SAl2S3 2Al+3Cl22AlCl3

4Al(固) + 3O2(气) ＝ 2Al2O3(固) + 3349.3  kJ·mol-1

4Al+3MnO22Al2O3+3Mn 2Al+Cr2O3Al2O3+2Cr

2Al+Fe2O3Al2O3+2Fe 2Al+3FeOAl2O3+3Fe

2Al + 6HCl = 2AlCl3 + 3H2↑ 2Al+3H2SO4＝Al2(SO4)3+3H2↑

2Al+6H2SO4(浓)Al2(SO4)3+3SO2↑+6H2O

Al+4HNO3(稀)＝Al(NO3)3+NO↑+2H2O (Al、Fe在冷、浓的H2SO4、HNO3中钝化)

2Al+2NaOH+2H2O＝2NaAlO2+3H2↑

#### [Al](#目录表" \o "返回目录)[2](#目录表" \o "返回目录)[O](#目录表" \o "返回目录)[3](#目录表" \o "返回目录)[、Al(OH)](#目录表" \o "返回目录)[3](#目录表" \o "返回目录)

Al2O3+3H2SO4＝Al2(SO4)3+3H2O (Al2O3是两性氧化物)

Al2O3+2NaOH＝2NaAlO2+H2O

2Al(OH)3Al2O3+3H2O

Al(OH)3+3HCl=AlCl3+3H2O 2Al(OH)3+3H2SO4=Al2(SO4)3+6H2O

Al(OH)3+NaOH＝NaAlO2+2H2O

#### [铝盐](#目录表" \o "返回目录)

AlCl3+3NaOH＝Al(OH)3↓+3NaCl

AlCl3+3NH3·H2O＝Al(OH)3↓+3NH4Cl

2AlCl3+3Na2CO3+3H2O＝2Al(OH)3↓+3CO2↑+6NaCl

AlCl3+3NaHCO3＝Al(OH)3↓+3CO2↑

AlCl3+3NaAlO2+ 6H2O＝4Al(OH)3↓

AlCl3 + 4NaOH ＝ Na[Al(OH)4] + 3NaCl

Al2(SO4)3+3Na2S+ 6H2O＝2Al(OH)3↓+3H2S↑

Al4C3 + 12H2O ＝ 4Al(OH)3↓ + 3CH4↑

**[As](#目录表" \o "返回目录)**

As2O3 + 6Zn + 12HCl ＝ 2AsH3↑ + 6ZnCl2 + 3H2O

3As2S3 + 28HNO3(稀) + 4H2O ＝ 6H3AsO4 + 9H2SO4 + 28NO↑

As2S3 + 28HNO3(浓)  ＝ 2H3AsO4 + 3H2SO4 + 28NO2↑ + 8H2O

## [B](#目录表)

### [Ba](#目录表)

Ba(OH)2 + CO2 ＝BaCO3↓ + H2O Ba(OH)2 + 2CO2(过量) ＝Ba(HCO3)2

Ba(OH)2+ H2SO4 ＝ BaSO4↓ + 2H2O 3Ba(OH)2+ 2H3PO3 ＝ Ba3(PO4)2↓ + 6H2O

BaCl2 + H2SO4 ＝ BaSO4↓ + 2HCl BaCl2 + Na2SO4 ＝ BaSO4↓ + 2NaCl

BaCO3+2HCl=BaCl2+CO2↑+H2O BaCO3+2HNO3=Ba(NO3)2+CO2↑+H2O

BaO2+H2SO4(稀)＝BaSO4↓+H2O2)

### [Be](#目录表)

 Be+2HCl=BaCl2+H2↑ Be+2NaOH= Na2BO2+H2↑

 BeCl2+2NaOH=Be(OH)2↓+2H2O

 Be(OH)2+2HCl=BeCl2+2H2O Be(OH)2+2NaOH=Na2BO2+2H2O

### [Br](#目录表)

Br2 +H2  2HBr Br2 + Fe ＝  FeBr3

Br2 + 2FeBr2 ＝2FeBr3 Br2 + NaI＝  NaBr + I2 Br2 + HI＝  HBr + I2

Br2 + H2O ＝  HBr + HBrO

Br2 + NaOH＝  NaBr + NaBrO + H2O

Br2+SO2 +2H2O＝H2SO4 +2HBr

Br2+H2S＝S↓ +2HBr

2Br2 + 3Na2CO3 + H2O ＝ 2NaHCO3 + 2NaBrO + 2NaBr + CO2↑

## [C](#目录表)

### [C](#目录表)

#### [C](#目录表)

C+2F2＝CF4

C+2Cl2＝CCl4

2C+O2(少量)2CO

C+O2(足量)CO2

C+CO22CO

C+H2OCO+H2(生成水煤气)

2C+SiO2Si+2CO(制得粗硅)

C+Si siC(金刚砂) C +2S CS2

3C+CaOCaC2+CO↑

3C+SiO2SiC+2CO↑

C+2H2SO4(浓) CO2↑+2SO2↑+2H2O

C +4HNO3(浓) CO2↑+4NO2↑+2H2O

#### [CO](#目录表)

2CO+O22CO2

CO+CuOCu+CO2

3CO+Fe2O32Fe+3CO2

CO+H2OCO2+H2

#### [CO](#目录表)[2](#目录表)

CO2+2Mg2MgO+C

CO2+H2O＝H2CO3

CO2+2NaOH(过量)＝Na2CO3+H2O

CO2(过量)+NaOH＝NaHCO3

CO2+Ca(OH)2(过量)＝CaCO3↓+H2O

2CO2(过量)+Ca(OH)2＝Ca(HCO3)2

CO2+2NaAlO2+3H2O＝2Al(OH)3↓+Na2CO3

CO2+C6H5ONa+H2O＝C6H5OH+NaHCO3

CO2+Na2O＝Na2CO3

2CO2+2Na2O2＝2Na2CO3+O2

CO2+NH3+NaCl+H2O＝NaHCO3↓+NH4Cl(侯氏制碱法)

### [Ca](#目录表)

CaO+H2O=Ca(OH)2 CaO+SiO2CaSiO3

2Ca(OH)2+2Cl2＝CaCl2+Ca(ClO)2+2H2O Ca(OH)2 +SO3＝CaSO4+H2O

CaCO3+2HNO3＝Ca(NO3)2+H2O+CO2↑

(用HNO3和浓H2SO4不能制备H2S、HI、HBr、(SO2)等还原性气体)

CaCO3+SiO2CaSiO3+CO2↑

CaF2+H2SO4(浓)＝CaSO4+2HF↑

Ca3(PO4)2+3H2SO4(浓)＝3CaSO4+2H3PO4 Ca3(PO4)2+2H2SO4(浓)＝2CaSO4+Ca(H2PO4)2

Ca3(PO4)2+4H3PO4＝3Ca(H2PO4)2(重钙)

CaH2+2H2O＝Ca(OH)2+2H2↑

### [Cl](#目录表)

Cl2 +H2 ＝2HCl (光照或点燃) Cl2 +2Na2NaCl

3Cl2 +2P2PCl3 Cl2 +PCl3  PCl5

3Cl2 +2Fe2FeCl3 Cl2+CuCuCl2

Cl2 +2FeCl2 ＝2FeCl3 2Cl2+2NaBr＝2NaCl+Br2

Cl2 + 2KI ＝2KCl + I2 \* 5Cl2+I2+6H2O＝2HIO3+10HCl

Cl2 +Na2S＝2NaCl+S↓ Cl2 +H2S＝2HCl+S↓

Cl2+SO2 +2H2O＝H2SO4 +2HCl Cl2+H2SO3+ H2O＝H2SO4+2HCl

Cl2+H2O＝HCl +HClO Cl2 +H2O2 ＝2HCl+O2

Cl2+2NaOH＝NaCl+NaClO+H2O 2Cl2+2Ca(OH)2＝CaCl2+Ca(ClO)2+2H2O

3Cl2 +6KOH(热、浓)＝5KCl+KClO3+3H2O

### [Cu](#目录表)

2Cu +O22CuO 2Cu +S  Cu2S Cu+ Cl2  CuCl2

3CuO+2NH33Cu+N2+3H2O

CuO+2HCl＝CuCl2+H2O CuO+H2SO4＝CuSO4+H2O

Cu(OH)2+2HCl＝CuCl2+2H2O Cu(OH)2+H2SO4＝CuSO4+2H2O

Cu(OH)2  CuO + H2O

CuCl2+H2S＝CuS↓+2HCl CuCl2+2NaOH＝Cu(OH)2↓+2NaCl

CuSO4+H2S＝CuS↓+H2SO4 CuSO4+2NaOH＝Cu(OH)2↓+Na2SO4

CuSO4+Ba(OH)2＝Cu(OH)2↓+BaSO4↓

## [F](#目录表)

### [F](#目录表)[2](#目录表)

　F2 + H2 = 2HF 2F2 + 2H2O = 4HF + O2

### [Fe](#目录表)

#### [Fe](#目录表)

2Fe + 3Cl22FeCl3 3Fe + 2O2 Fe3O4

Fe + SFeS 2Fe+3Br2＝2FeBr3

Fe+I2FeI2 Fe+SFeS

3Fe+4H2O(g)Fe3O4+4H2 Fe+2HCl＝FeCl2+H2↑

Fe+CuCl2＝FeCl2+Cu Fe+SnCl4＝FeCl2+SnCl2

Fe + H2S＝FeS+H2↑

2Fe +6H2SO4(浓)＝Fe2(SO4)3+3SO2↑+6H2O

Fe +H2SO4(稀)＝FeSO4+H2↑

Fe +6HNO3＝Fe(NO3)3+3NO2↑+3H2O

Fe +4HNO3＝Fe(NO3)3+NO↑+2H2O

8Fe +30HNO3＝8Fe(NO3)3+3N2O↑+15H2O

10Fe +36HNO3＝10Fe(NO3)3+3N2↑+18H2O

8Fe +30HNO3＝8Fe(NO3)3+3NH4NO3+9H2O

Fe(Al) +H2SO4(浓)室温下钝化

Fe  + (CH3COO)2Cu  ＝ Cu + (CH3COO)2Fe

#### [FeO](#目录表)

3FeO + 2AlAl2O3+3Fe 6FeO+O22Fe3O4

FeO+4HNO3＝Fe(NO3)3+NO2↑+2H2O

#### [Fe](#目录表)[2](#目录表)[O](#目录表)[3](#目录表)

Fe2O3 + 2AlAl2O3+2Fe Fe2O3 + 3CO2Fe+3CO2

Fe2O3+3H2＝2Fe+3H2O (制还原铁粉) Fe2O3+6HCl＝2FeCl3+3H2O

#### [Fe](#目录表)[3](#目录表)[O](#目录表)[4](#目录表)

Fe3O4+4H23Fe+4H2O Fe3O4+8HCl(浓)FeCl2+2FeCl3+4H2O

#### [Fe(OH)](#目录表)[2](#目录表)[、Fe(OH)](#目录表)[3](#目录表)

4Fe(OH)2 + O2 + 2H2O == 4 Fe(OH)3 2Fe(OH)3Fe2O3+3H2O

#### [FeCl](#目录表)[2](#目录表)

2FeCl2 + Cl2＝2FeCl3 FeCl2+Mg＝Fe+MgCl2

#### [FeCl](#目录表)[3](#目录表)

2FeCl3+Fe＝3FeCl2 2FeCl3+Cu＝2FeCl2+CuCl2(用于雕刻铜线路版)

2FeCl3+H2SO3+H2O＝H2SO4+2FeCl2+2HCl

2FeCl3+Zn＝2FeCl2+ZnCl2 2FeCl3+H2S＝2FeCl2+2HCl+S↓

2FeCl3+2KI＝2FeCl2+2KCl+I2

FeCl3+3NH3·H2O＝Fe(OH)3↓+3NH4Cl

2FeCl3+3Na2CO3+3H2O＝2Fe(OH)3↓+3CO2↑+6NaCl

FeCl3+3NaHCO3＝Fe(OH)3↓+3CO2↑

2FeCl3 + SO2 + 2H2O ＝ 2FeCl2 + H2SO4 + 2HCl      BaCl2 + H2SO4 ＝ BaSO4↓ + 2HCl
FeCl3 + 3KSCN == Fe(SCN)3 + 3KCl

#### [FeS](#目录表)

FeS + 2HCl == FeCl2 + H2S↑ FeS + H2SO4 == FeSO4 + H2S↑

4FeS2 + 11O2 == 2Fe2O2 + 8SO2

#### [其它Fe化合物](#目录表)

Fe2(SO4)3+2Ag＝FeSO4+Ag2SO4(较难反应)

Fe(NO3)3+Ag 不反应

## [H](#目录表)

### [H](#目录表)[2](#目录表)

H2 +F2 ＝ 2HF (冷暗处 爆炸)

H2+Cl2 ＝2HCl (光照或点燃)

3H2+N22NH3 H2+S H2S

6H2+P44PH3 2H2+SiCl4Si(纯)+4HCl

H2+2Na＝2NaH

3H2+Fe2O3＝2Fe+3H2O (制还原铁粉)

4H2+Fe3O43Fe+4H2O 2H2 +SiO2Si+2H2O

### [Hg](#目录表)

3Hg + 8HNO3(稀) = 3Hg(NO3)2 + 2NO2↑+ 4H2O

Hg + 4HNO3(浓) = Hg(NO3)2 + 2NO2↑+ 2H2O

### [HF](#目录表)

4HF+SiO2＝SiF4+2H2O

### [HCl](#目录表)

6HCl +2Al＝2AlCl3+3H2↑ 2HCl +Fe＝FeCl2+H2↑

4HCl(浓)+MnO2MnCl2+Cl2+2H2O 4HCl(g)+O22Cl2+2H2O

16HCl+2KMnO4＝2KCl+2MnCl2+5Cl2+8H2O

14HCl+K2Cr2O7＝2KCl+2CrCl3+3Cl2+7H2O HCl +NH3＝NH4Cl(白烟)

2HCl +FeO＝FeCl2+3H2O 6HCl +Fe2O3＝2FeCl3+3H2O

8HCl(浓) +Fe3O4FeCl2+2FeCl3+4H2O HCl +Na3PO4＝Na2HPO4+NaCl

HCl +Na2HPO4＝NaH2PO4+NaCl HCl +NaH2PO4＝H3PO4+NaCl

HCl +Na2CO3＝NaHCO3+NaCl HCl +NaHCO3＝NaCl+H2O+CO2

### [HBr](#目录表)

HBr + NaOH = NaBr + H2O

2HBr + Cl2 = 2HCl + Br2

### [HI](#目录表)

2HIH2+I2

2HI + Cl2 = 2HCl + I2 HI + NaOH = NaI + H2O

### [H](#目录表)[2](#目录表)[O](#目录表)

2F2 +2H2O＝4HF+O2 Cl2+H2O＝HCl+HClO

2Na+2H2O＝2NaOH+H2↑ Mg+2H2O＝Mg(OH)2+H2↑

3Fe+4H2O(g)Fe3O4+4H2 2H2O2H2↑+O2

SO2+H2O＝H2SO3 SO3+H2O＝H2SO4

3NO2+H2O＝2HNO3+NO N2O5+H2O＝2HNO3

P2O5+H2O(冷)＝2HPO3 P2O5+3H2O(热)＝2H3PO4

CO2+H2O＝H2CO3

### [H](#目录表)[2](#目录表)[O](#目录表)[2](#目录表)

2H2O2＝2H2O+O2↑ H2O2 + Cl2＝2HCl+O2

5H2O2 + 2KMnO4 + 6HCl ＝2MnCl2 + 2KCl + 5O2↑+ 8H2O

### [H](#目录表)[2](#目录表)[S](#目录表)

H2S + Cl2＝2HCl+S↓ H2S + Mg＝MgS+H2

2H2S+3O2(足量)＝2SO2+2H2O 2H2S+O2(少量)＝2S+2H2O

2H2S+SO2＝3S+2H2O H2S+H2SO4(浓)＝S↓+SO2+2H2O

H2SH2+S 3H2S+2HNO3(稀)＝3S↓+2NO+4H2O

5H2S+2KMnO4+3H2SO4＝2MnSO4+K2SO4+5S+8H2O

\* 3H2S+K2Cr2O7+4H2SO4＝Cr2(SO4)3+K2SO4+3S+7H2O

\* H2S+4Na2O2+2H2O＝Na2SO4+6NaOH

H2S+Fe＝FeS+H2↑ H2S+CuCl2＝CuS↓+2HCl

H2S+2AgNO3＝Ag2S↓+2HNO3 H2S+HgCl2＝HgS↓+2HCl

H2S+Pb(NO3)2＝PbS↓+2HNO3 H2S +4NO2＝4NO+SO3+H2O

### [H](#目录表)[2](#目录表)[CO](#目录表)[3](#目录表)

H2CO3=CO2↑+H2O

### [HClO](#目录表)

HClO=HCl + O2↑

### [HNO](#目录表)[3](#目录表)

3HNO3+Ag3PO4＝H3PO4+3AgNO3

Al+4HNO3(稀)＝Al(NO3)3+NO↑+2H2O

3As2S3 + 28HNO3 + 4H2O ＝ 6H3AsO4 + 9H2SO4 + 28NO↑

 4HNO3(浓)+C  CO2↑+4NO2↑+2H2O

2HNO3+CaCO3＝Ca(NO3)2+H2O+CO2↑

6HNO3+Fe＝Fe(NO3)3+3NO2↑+3H2O

4HNO3+Fe＝Fe(NO3)3+NO↑+2H2O

30HNO3+8Fe＝8Fe(NO3)3+3N2O↑+15H2O

36HNO3+10Fe＝10Fe(NO3)3+3N2↑+18H2O

30HNO3+8Fe＝8Fe(NO3)3+3NH4NO3+9H2O

FeO+4HNO3＝Fe(NO3)3+NO2↑+2H2O

3H2S+2HNO3(稀)＝3S↓+2NO+4H2O

4HNO3＝4NO2+O2+2H2O(见光或受热分解)

NH3+HNO3＝NH4NO3(白烟)

(用HNO3和浓H2SO4不能制备H2S、HI、HBr、(SO2)

3Na2S+8HNO3(稀)＝6NaNO3+2NO+3S↓+4H2O

3Na2SO3+2HNO3(稀)＝3Na2SO4+2NO↑+H2O

\* 5HNO3(浓)+P＝H3PO4+5NO2↑+H2O

P4+20HNO3(浓)＝4H3PO4+20NO2+4H2O

S+6HNO3(浓)＝H2SO4+6NO2↑+2H2O

3S+4 HNO3(稀)＝3SO2↑+4NO↑+2H2O

\* S +6HNO3(浓)＝H2SO4+6NO2↑+2H2O

### [H](#目录表)[3](#目录表)[PO](#目录表)[4](#目录表)

4H3PO4+Ca3(PO4)2＝3Ca(H2PO4)2(重钙)

H3PO4(浓)+NaBr＝NaH2PO4+HBr

H3PO4(浓)+NaI＝NaH2PO4+HI

### [H](#目录表)[2](#目录表)[SO](#目录表)[3](#目录表)

H2SO3+X2+H2O＝H2SO4+2HX

(X表示Cl2、Br2、I2)

2H2SO3+O2＝2H2SO4

H2SO3+H2O2＝H2SO4+H2O

5H2SO3+2KMnO4＝2MnSO4+K2SO4+2H2SO4+3H2O

H2SO3+2FeCl3+H2O＝H2SO4+2FeCl2+2HCl

H2SO3＝H2O+SO2

2H2SO3+2H2S＝3S↓+2H2O

### [H](#目录表)[2](#目录表)[SO](#目录表)[4](#目录表)

Zn +H2SO4＝ZnSO4+H2↑

Fe +H2SO4＝FeSO4+H2↑

Mg+H2SO4＝MgSO4+H2↑

2Al+3H2SO4＝Al2(SO4)3+3H2↑

2Al+6H2SO4(浓)Al2(SO4)3+3SO2↑+6H2O

2NH3+H2SO4＝(NH4)2SO4

2Al+6H2SO4(浓)Al2(SO4)3+3SO2↑+6H2O

H2S+H2SO4(浓)＝S↓+SO2+2H2O

P2O5+3H2SO4(浓)＝2H3PO4+3SO3

BaO2+H2SO4(稀)＝BaSO4+H2O2)

Na2O2+H2SO4(冷、稀)＝Na2SO4+H2O2

MgO+H2SO4＝MgSO4+H2O

Al2O3+3H2SO4＝Al2(SO4)3+3H2O

2H2SO4(浓)+CCO2 ↑ +2SO2↑+2H2O

2H2SO4(浓)+S＝3SO2↑+2H2O

H2SO4(浓)+Fe(Al) 室温下钝化

6H2SO4(浓)+2Fe＝Fe2(SO4)3+3SO2↑+6H2O

2H2SO4(浓)+CuCuSO4+SO2↑+2H2O

H2SO4(浓)+2HBrSO2+Br2+2H2O

H2SO4(浓)+2HISO2+I2+2H2O

H2SO4(浓) +CaF2＝CaSO4+2HF↑

H2SO4(浓)+NaClNaHSO4+HCl↑

H2SO4(浓) +2NaClNa2SO4+2HCl

H2SO4(浓)+NaNO3NaHSO4+HNO3↑(微热)

3H2SO4(浓)+Ca3(PO4)2＝3CaSO4+2H3PO4

2H2SO4(浓)+Ca3(PO4)2＝2CaSO4+ Ca(H2PO4)2

## [I](#目录表)

I2 + H2  2HI

I2 +Fe  FeI2

I2 + 2NaOH = NaI + NaIO +H2O

## [K](#目录表)

### [K](#目录表)

K + O2  KO2

2K + 2H2O = 2KOH + H2↑

### [K](#目录表)[2](#目录表)[O、K](#目录表)[2](#目录表)[O](#目录表)[2](#目录表)

K2O + H2O = 2KOH

K2O + CO2 = K2CO3

2K2O2 + 2CO2 = K2CO3 +O2

2K2O2 + 2H2O = 4KOH +O2

### [KOH](#目录表)

2KOH +CO2 = K2CO3 +H2O

KOH +CO2 = KHCO3

### [K](#目录表)[2](#目录表)[CO](#目录表)[3](#目录表)

K2CO3 +2HCl = 2KCl + CO2↑+ H2O

K2CO3 +CaCl2 = CaCO3↓+ 2KC

K2CO3 +2AgNO3 = Ag2CO3↓+ 2KNO3

### [KHCO](#目录表)[3](#目录表)

KHCO3 +HCl = KCl + CO2↑+ H2O

2KHCO3 K2CO3 + CO2↑+ H2O

### [KClO](#目录表)[3](#目录表)

2KClO3  2KCl + 3O2↑

KClO3 +6HCl = KCl +3Cl2↑ + 3H2O

### [KI](#目录表)

2KI + Cl2 = 2KCl + I2

KI + AgNO3 = AgI↓+ KNO3

### [KAl(SO](#目录表)[4](#目录表)[)](#目录表)[2](#目录表)

2KAl(SO4)2 + 6NaOH = K2SO4 +3Na2SO4 + 2Al(OH)3↓

2KAl(SO4)2 + 3Ba(OH)2 = K2SO4 + 3BaSO4↓+ 2Al(OH)3↓

KAl(SO4)2 + 2Ba(OH)2 = KAlO2 +2BaSO4↓

### [KMnO](#目录表)[4](#目录表)

2KMnO4  K2MnO4 + MnO2 + O2↑

2KMnO4 +16HCl = 2KCl + 2MnCl2 +5Cl2↑ + 8H2O

2KMnO4 + 5H2O2 + 6HCl = 2KCl + 2MnCl2 +5O2↑ + 8H2O

### [KSCN](#目录表)

3KSCN + FeCl3 = Fe(SCN)3 + 3KCl

### [KH](#目录表)

KH + H2O = KOH + H2↑

## [L](#目录表)

### [Li](#目录表)

Li + O2  Li2O

2Li + 2H2O = 2LiOH + H2↑

### [Li](#目录表)[2](#目录表)[O](#目录表)

Li2O + CO2 = Li2CO3

Li2O + H2O = 2LiOH

### [LiOH](#目录表)

2LiOH +CO2 = Li2CO3↓ +H2O

LiOH +CO2 = LiHCO3

### [Li](#目录表)[2](#目录表)[CO](#目录表)[3](#目录表)

Li2CO3 +2HCl = 2LiCl + CO2↑+ H2O

### [LiHCO](#目录表)[3](#目录表)

LiHCO3 +HCl = LiCl + CO2↑+ H2O

2LiHCO3 Li2CO3 + CO2↑+ H2O

## [M](#目录表)

### [Mg](#目录表)

2Mg+O22MgO Mg + 2H2O = 2Mg(OH)2↓ + H2↑

Mg + Cl2MgCl2 2Mg +CO22MgO+C

Mg + S ＝ MgS Mg + Br2 ＝ MgBr2

Mg +2HCl ＝ MgCl2 + H2↑ Mg + H2SO4 ＝ MgSO4 + H2↑

2Mg+TiCl4(熔融)＝Ti+2MgCl2 Mg+2RbCl(熔融)＝MgCl2+2Rb

### [MgO](#目录表)

MgO + 2HCl = MgCl2 +H2O

MgO + H2O = Mg(OH)2↓

### [Mg(OH)](#目录表)[2](#目录表)

Mg(OH)2 + 2HCl = MgCl2 +2H2O

### [MgCO](#目录表)[3](#目录表)

MgCO3 +2HCl = 2MgCl2 + CO2↑+ H2O

MgCO3 +2H2O  Mg(OH)2↓+ CO2↑

MgCO3  CO2↑+ MgO

### [Mg(HCO](#目录表)[3](#目录表)[)](#目录表)[2](#目录表)

Mg(HCO3)2 + 2HCl = MgCl2 + 2CO2↑+ 2H2O

2Mg(HCO3)2  Mg(OH)2↓ + CO2↑+ H2O

### [MgSO](#目录表)[4](#目录表)

MgSO4 + Ba(OH)2 = Mg(OH)2↓ + BaSO4↓

MgSO4 + 2NaOH = Mg(OH)2↓ + Na2SO4↓

### [MnO2](#目录表)

MnO2 + 4HCl(浓)  MnCl2 + Cl2↑+ 2H2O

## [N](#目录表)

### [N](#目录表)[2](#目录表)

N2+3H22NH3 N2+O2  2NO

N2+3MgMg3N2 N2+6Na＝2Na3N

### [NO、NO](#目录表)[2](#目录表)[、N](#目录表)[2](#目录表)[O](#目录表)[5](#目录表)

2NO+O2＝2NO2

NO+NO2+2NaOH＝2NaNO2(用于制硝酸工业中吸收尾气中的NO和NO2)

6NO + 4NH3 5N2 + 6H2O

NO2+2KI+H2O＝NO+I2+2KOH(不能用淀粉KI溶液鉴别溴蒸气和NO2)

4NO2+H2S＝4NO+SO3+H2O

NO2 + SO2＝SO3+NO

3NO2+H2O＝2HNO3+NO

N2O5+H2O＝2HNO3

### [NH](#目录表)[3](#目录表)

2NH3+3CuO3Cu+N2+3H2O

2NH3+3Cl2＝N2+6HCl

8NH3+3Cl2＝N2+6NH4Cl

4NH3+3O2(纯氧)2N2+6H2O

4NH3+5O24NO+6H2O

4NH3+6NO5N2+6HO(用氨清除NO)

NH3+HCl＝NH4Cl(白烟)

NH3+HNO3＝NH4NO3(白烟)

2NH3+H2SO4＝(NH4)2SO4

NH3+NaCl+H2O+CO2＝NaHCO3↓+NH4Cl(侯氏制碱法)

2NH3+SO2+H2O＝(NH4)2SO3

NH3·H2O NH3↑+H2O

NH3 + H2ONH3·H2ONH4+ + OH-

### [NH](#目录表)[4](#目录表)[HCO](#目录表)[3](#目录表)[、(NH](#目录表)[4](#目录表)[)](#目录表)[2](#目录表)[CO](#目录表)[3](#目录表)

NH4HCO3＝NH3+H2O+CO2

(NH4)2CO3＝2NH3↑+H2O+CO2↑

### [NH](#目录表)[4](#目录表)[Cl](#目录表)

NH4Cl＝NH3+HCl

2NH4Cl + Ca(OH)2CaCl2 + NH3↑ + H2O

NH4Cl + NaOH  NaCl + NH3↑ + H2O

NH4Cl + NaOH == NaCl + NH3·H2O

### [NH](#目录表)[4](#目录表)[NO](#目录表)[3](#目录表)

NH4 NO3 + NaOH == Na NO3 + NH3·H2O

NH4 NO3 + NaOH  Na NO3 + NH3↑ + H2O

5NH4NO32HNO3 + 4N2↑ + 9H2O

### [(NH](#目录表)[4](#目录表)[)](#目录表)[2](#目录表)[SO](#目录表)[3](#目录表)[、(NH](#目录表)[4](#目录表)[)](#目录表)[2](#目录表)[SO](#目录表)[4](#目录表)

(NH4)2SO3+SO2+H2O＝2NH4HSO3

(NH4)2SO4 + 2NaOH == Na2SO4 + 2 NH3·H2O

 (NH4)2SO4 + 2NaOH  Na2SO4 + 2NH3↑ + 2H2O

### [Na、Na](#目录表)[2](#目录表)[O、Na](#目录表)[2](#目录表)[O](#目录表)[2](#目录表)

4Na+O2＝2Na2O 2Na+O2Na2O2 Cl2 +2Na2NaCl

2Na+S＝Na2S(爆炸) 2Na+2H2O＝2NaOH+H2↑ 2Na+H22NaH

2Na+2NH3＝2NaNH2+H2 4Na+TiCl4(熔融)＝4NaCl+Ti

 Na2O+H2O＝2NaOH 2Na2O+O22Na2O2 Na2O+SO3＝Na2SO4

Na2O+CO2＝Na2CO3 Na2O+2HCl＝2NaCl+H2O

Na2O2+2Na＝2Na2O(此反应用于制备Na2O)

2Na2O2+2H2O＝4NaOH+O2↑(此反应分两步Na2O2+2H2O＝2NaOH+H2O2 ；2H2O2＝2H2O+O2↑。H2O2的制备可利用类似的反应)

2Na2O2+2CO2＝2Na2CO3+O2

Na2O2+H2SO4(冷、稀)＝Na2SO4+H2O2

### [NaH](#目录表)

NaH + H2O = NaOH + H2↑

### [NaOH](#目录表)

2NaOH+Si+H2O＝Na2SiO3+2H2↑

6NaOH +3S2Na2S+Na2SO3+3H2O

2NaOH+2Al+2H2O＝2NaAlO2+3H2↑

2NaOH(过量) +CO2＝Na2CO3+H2O

NaOH +CO2(过量)＝NaHCO3

2NaOH +SiO2＝Na2SiO3+H2O(常温下强碱缓慢腐蚀玻璃)

2NaOH+Al2O3＝2NaAlO2+H2O

2NaOH+Cl2＝NaCl+NaClO+H2O

NaOH+HCl＝NaCl+H2O

NaOH+H2S(足量)＝NaHS+H2O

2NaOH+H2S(少量)＝Na2S+2H2O

3NaOH+AlCl3＝Al(OH)3↓+3NaCl

NaOH+Al(OH)3＝NaAlO2+2H2O

NaOH+NH4ClNaCl+NH3↑+H2O

4NaOH  + AlCl3＝ Na[Al(OH)4] + 3NaCl
2NaOH  + P2O5 ＝ 2NaPO3 + H2O

6NaOH +  P2O5＝ 2Na3PO3 + 3H2O

### [NaAlO](#目录表)[2](#目录表)

2NaAlO2+CO2+3H2O＝2Al(OH)3↓+Na2CO3

3NaAlO2+AlCl3+6H2O＝4Al(OH)3↓

### [NaCl、NaClO、NaBr、NaI](#目录表)

NaCl + H2SO4(浓) NaHSO4+HCl↑

H2SO4(浓) +2NaClNa2SO4+2HCl

2NaI+Cl2＝2NaCl+I2

NaBr +H3PO4(浓)＝NaH2PO4+HBr

NaI+ H3PO4(浓)＝NaH2PO4+HI

### [Na](#目录表)[2](#目录表)[CO](#目录表)[3](#目录表)[、NaHCO](#目录表)[3](#目录表)

Na2CO3+SiO2 Na2SiO3+CO2

Na2CO3+HCl＝NaHCO3+NaCl

NaHCO3+HCl＝NaCl+H2O+CO2

3Na2CO3+2AlCl3+3H2O＝2Al(OH)3↓+3CO2↑+6NaCl

3Na2CO3+2FeCl3+3H2O＝2Fe(OH)3↓+3CO2↑+6NaCl

3NaHCO3+AlCl3＝Al(OH)3↓+3CO2↑

3NaHCO3+FeCl3＝Fe(OH)3↓+3CO2↑

NaHCO3 +HCl = NaCl + CO2↑+ H2O

2NaHCO3 Na2CO3 + CO2↑+ H2O

3Na2CO3 + 2Br2 + H2O ＝ 2NaHCO3 + 2NaBrO + 2NaBr + CO2↑
 NaHCO3  + Br2  ＝ NaBr + HBrO + CO2↑

### [NaNO](#目录表)[3](#目录表)[、NaNO](#目录表)[2](#目录表)

2NaNO3  2NaNO2 + O2↑

H2SO4(浓)+NaNO3NaHSO4+HNO3↑(微热)

KClO3 +6HCl = KCl +3Cl2↑ + 3H2O

NaNO2 + NH4Cl = NaCl + N2↑ + 2H2O

### [Na](#目录表)[3](#目录表)[PO](#目录表)[4](#目录表)[、NaH](#目录表)[2](#目录表)[PO](#目录表)[4](#目录表)[、Na](#目录表)[2](#目录表)[HPO](#目录表)[4](#目录表)

Na3PO4+HCl＝Na2HPO4+NaCl

Na2HPO4+HCl＝NaH2PO4+NaCl

NaH2PO4+HCl＝H3PO4+NaCl

### [Na](#目录表)[2](#目录表)[S、NaHS](#目录表)

Na2S + Cl2＝2NaCl+S↓

3Na2S+8HNO3(稀)＝6NaNO3+2NO+3S↓+4H2O

3Na2S+Al2(SO4)3+6H2O＝2Al(OH)3↓+3H2S↑

### [Na](#目录表)[2](#目录表)[SO](#目录表)[4](#目录表)[、Na](#目录表)[2](#目录表)[SO](#目录表)[3](#目录表)[、Na](#目录表)[2](#目录表)[S](#目录表)[2](#目录表)[O](#目录表)[3](#目录表)

3Na2SO3+2HNO3(稀)＝3Na2SO4+2NO↑+H2O

2Na2SO3+O2＝2Na2SO4

Na2S2O3+H2SO4＝Na2SO4+S+SO2+H2O

Na2SO3 + SO2 + H2O ＝ 2NaHSO3       2NaHSO3Na2SO3 + SO2↑ + H2O

### [Na](#目录表)[2](#目录表)[SiO](#目录表)[3](#目录表)

Na2SiO3 + 2HCl == H2SiO3↓+ 2NaCl

### [C6H5ONa](#目录表)

C6H5ONa+CO2+ H2O＝C6H5OH+NaHCO3

## [O](#目录表)

### [O2](#目录表)

O2  + 2H2   2H2O O2 + K  KO2

2O2 +3FeFe3O4

O2 + S SO2

O2 + N22NO 3O22O3

4P+5O2P4O10(常写成P2O5)

C+O2(足量)CO2

Si(粉)+O2SiO2

4Na+O2＝2Na2O

2Na2O+O22Na2O2

2Na+O2＝Na2O2

2Mg+O22MgO

4Al+3O22Al2O3(钝化)

4NH3+5O24NO+6H2O

2SO2+O22SO3

2CO+O22CO2

6FeO+O22Fe3O4

2H2SO3+O2＝2H2SO4

4Fe(OH)2+O2+2H2O＝4Fe(OH)3

2Na2SO3+O2＝2Na2SO4

### [O3](#目录表)

2O3 = 3O2

O3 + 2HI == I2 + O2 + H2O

## [P](#目录表)

### [P](#目录表)

2P +3Cl2 2PCl3 PCl3 + Cl2PCl5

P4+6H24PH3

4P+5O2P4O10(常写成P2O5)

P4+20HNO3(浓)＝4H3PO4+20NO2+4H2O

11P+15CuSO4+24H2O＝5Cu3P+6H3PO4+15H2SO4

PH3 + 2O2 == H3PO4

### [P2O3、P2O5](#目录表)

P2O5+H2O(冷)＝2HPO3

P2O5+3H2O(热)＝2H3PO4

(P2O5极易吸水、可作气体干燥剂

\* P2O5+3H2SO4(浓)＝2H3PO4+3SO3

P2O5 + 2NaOH ＝ 2NaPO3 + H2O        P2O5 + 6NaOH ＝ 2Na3PO3 + 3H2O

### [Pb、PbO2](#目录表)

Pb + 2HCl = PbCl2 + H2↑

PbO2+ 4HCl(浓) PbCl2+Cl2↑+2H2O

### [铅盐](#目录表)

Pb(NO3)2+H2S＝PbS↓+2HNO3

(CH3COO)2Pb + H2S = PbS↓ + CH3COOH

## [R](#目录表)

2Rb + 2H2O = 2RbOH + H2↑

RbOH + HCl = RbCl + H2O

## [S](#目录表)

### [S](#目录表)

S+H2H2S 2S+CCS2 S+FeFeS

S+2CuCu2S 3S+2AlAl2S3 S+ZnZnS

S+O2SO2

S+6HNO3(浓)＝H2SO4+6NO2↑+2H2O

3S+4 HNO3(稀)＝3SO2↑+4NO↑+2H2O

3S+6NaOH2Na2S+Na2SO3+3H2O

S + 2Na＝Na2S(爆炸)

S + Mg＝MgS

S + Fe FeS

S + 2H2SO4(浓)＝3SO2↑+2H2O

### [SO](#目录表)[2](#目录表)

SO2 + 2H2S＝3S+2H2O

2SO2+O22SO3

2SO2+O2+2H2O＝2H2SO4

SO2+Cl2+2H2O＝H2SO4+2HCl

SO2+Br2+2H2O＝H2SO4+2HBr

SO2+I2+2H2O＝H2SO4+2HI

\* SO2+NO2＝SO3+NO

SO2+2H2S＝3S+2H2O

SO2+H2O＝H2SO3

SO2+2NH3+H2O＝(NH4)2SO3

SO2+(NH4)2SO3+H2O＝2NH4HSO3

SO2+Ca(OH)2＝CaSO3↓+H2O

(不能用澄清石灰水鉴别SO2和CO2.可用品红鉴别)

2NaOH+SO2(少量)＝Na2SO3+H2O

NaOH+SO2(足量)＝NaHSO3

Cl2+SO2 +2H2O＝H2SO4 +2HCl

### [SO](#目录表)[3](#目录表)

SO3+H2O＝H2SO4

SO3+MgO＝MgSO4

SO3+Ca(OH)2＝CaSO4+H2O

SO3+Na2O＝Na2SO4

\* SO3+2KI＝K2SO3+I2

### [Si](#目录表)

Si(粗)+2Cl2SiCl4 SiCl4+2H2Si(纯)+4HCl

Si(粉)+O2SiO2 Si+CsiC(金刚砂)

Si+2NaOH+H2O＝Na2SiO3+2H2

### [SiO2](#目录表)

2C+SiO2Si+2CO(制得粗硅)

3C+SiO2SiC+2CO↑

2Mg+SiO22MgO+Si

4HF+SiO2＝SiF4+2H2O

SiO2+2H2Si+2H2O

\* SiO2+2Mg2MgO+Si

SiO2+CaOCaSiO3

SiO2+2NaOH＝Na2SiO3+H2O (常温下强碱缓慢腐蚀玻璃)

SiO2+Na2CO3Na2SiO3+CO2

SiO2+CaCO3CaSiO3+CO2

2NaOH+SiO2＝Na2SiO3+H2O

## [Z](#目录表)

### [Zn](#目录表)

Zn +S  ZnS

Zn + 2HCl ＝ ZnCl2 + H2↑

Zn + H2SO4 ＝ ZnSO4 + H2↑

Zn + 2NaOH ＝ Na2ZnO2 + H2↑

Zn + 2FeCl3 ＝2FeCl2 + ZnCl2

### [ZnO](#目录表)

ZnO + 2HCl = ZnCl2 + H2O

ZnO + 2NaOH = Na2ZnO2 + H2O

### [Zn(OH)](#目录表)[2](#目录表)

Zn(OH)2 +2HCl = ZnCl2 + 2H2O

Zn(OH)2 + 2NaOH = Na2ZnO2 + 2H2O

Zn(OH)2 + 4NH3·H2O = Zn(NH3)4(OH)2 + 4H2O

Zn(OH)2  ZnO + H2O