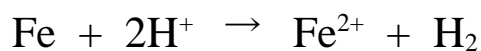
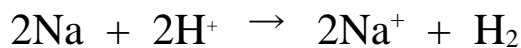


**反応式の作り方 1**

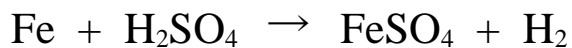
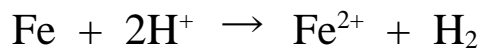
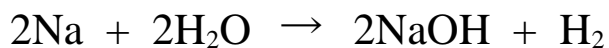
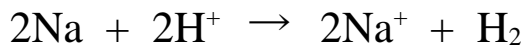
**金属が溶けて、H<sub>2</sub> を発生する場合**

(例)

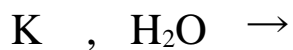
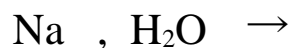
1. 金属と H<sup>+</sup> で考える。2. 水の場合は、OH<sup>-</sup> を両辺に加える。

2'. 酸の場合は、酸の陰イオンを両辺に加える。

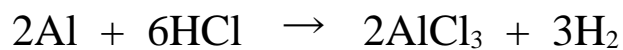
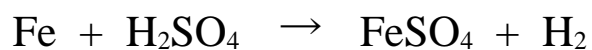
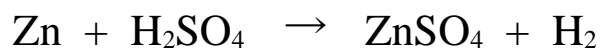
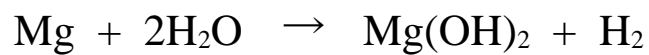
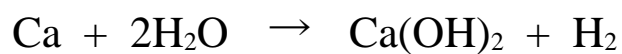
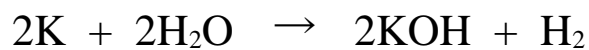
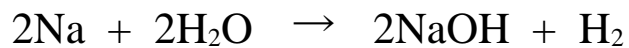
3. たし算をする。



(問)

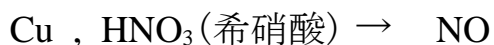
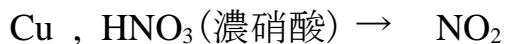


(解)

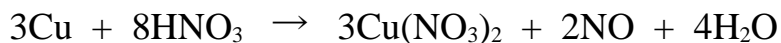
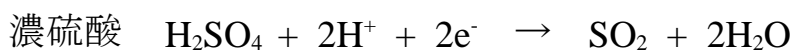
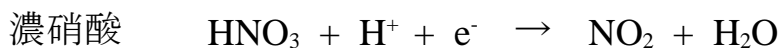
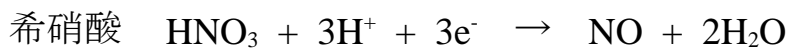


反応式の作り方 2

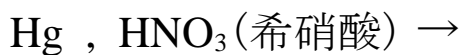
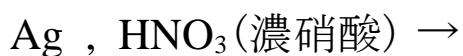
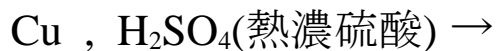
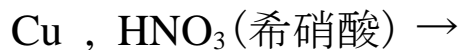
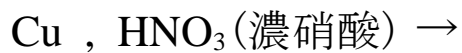
金属が溶けて、H<sub>2</sub>以外の気体(SO<sub>2</sub>,NO,NO<sub>2</sub>)を発生する場合



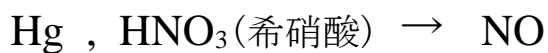
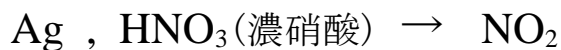
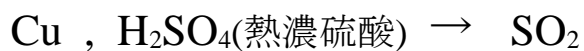
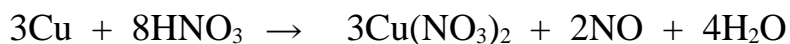
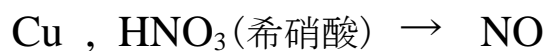
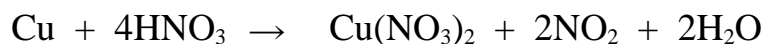
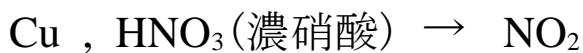
1. 酸化・還元の半反応式を組み合わせる。
2. H<sup>+</sup>がある場合は、酸の陰イオンを組み合わせる。



(問)



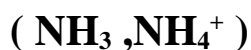
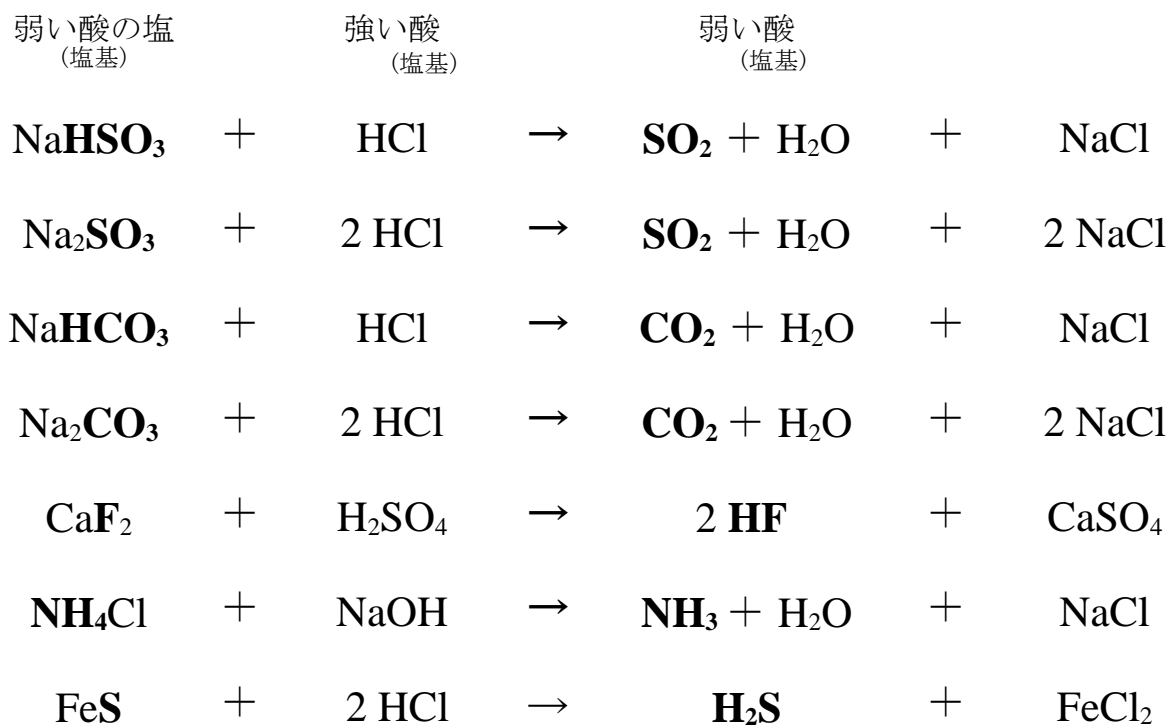
(解)



反応式の作り方 3

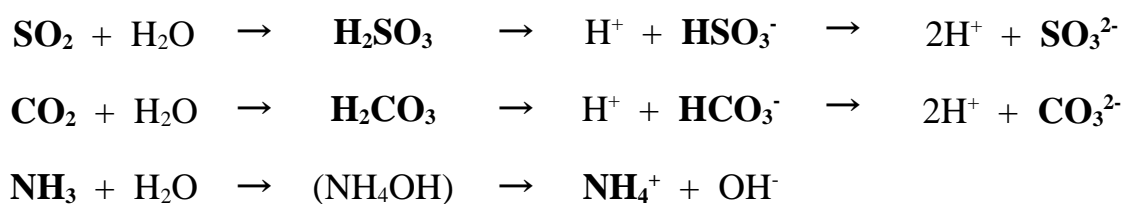
塩と酸（塩基）との反応で、気体(SO<sub>2</sub>, CO<sub>2</sub>, HF, NH<sub>3</sub>)が発生する反応  
**強い酸**(塩基)により、**弱い酸**(塩基)が遊離する場合

(例)



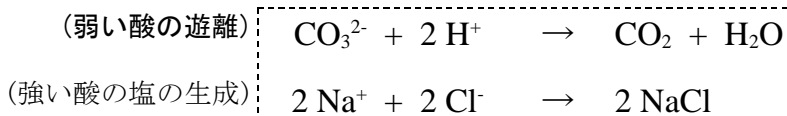
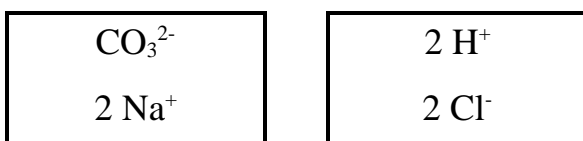
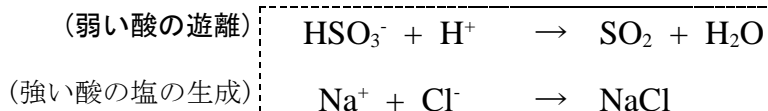
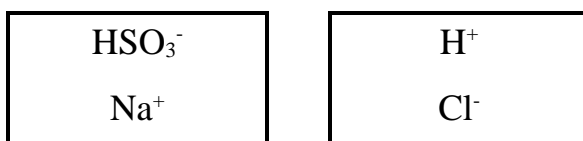
はそれぞれ同じものであると思え。

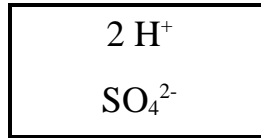
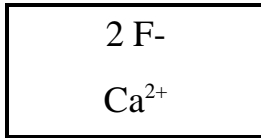
気体が水に溶けるときの反応



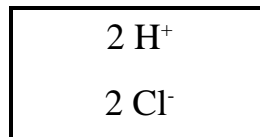
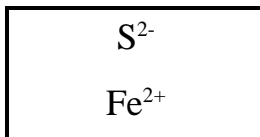
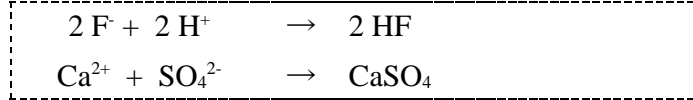
組み立て方

1. 塩と酸（塩基）の電離の式を書く。
2. 「気体が水に溶けるときの反応」の逆の反応が起こり，気体が発生する。

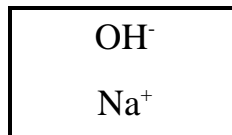
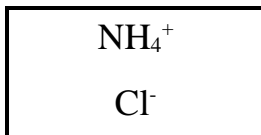
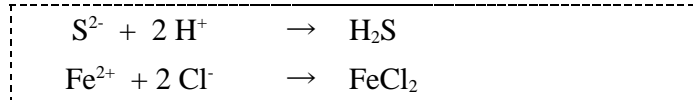




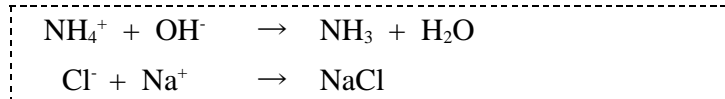
(弱い酸の遊離)  
(強い酸の塩の生成)



(弱い酸の遊離)  
(強い酸の塩の生成)



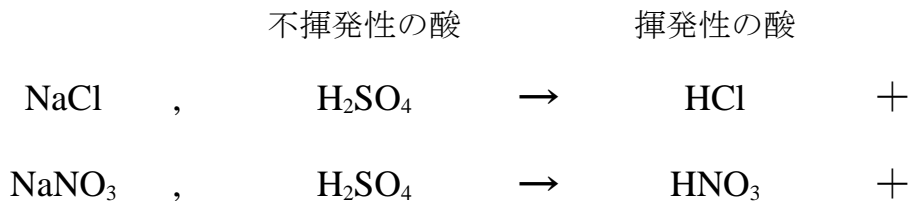
(弱い塩基の遊離)  
(強い塩基の塩の生成)



**反応式の作り方 3'**

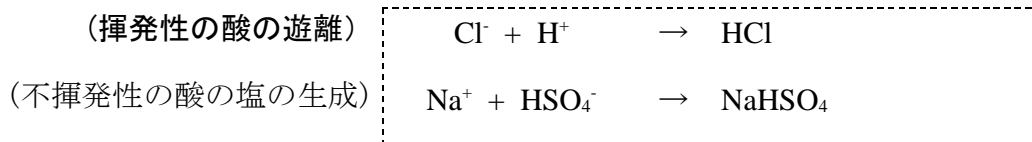
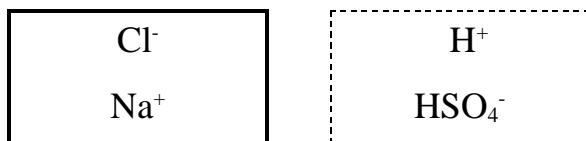
不揮発性の酸により、揮発性の酸が遊離する場合

(例)



組み立て方

塩と酸（塩基）の電離の式を書く。



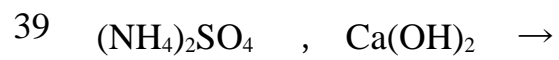
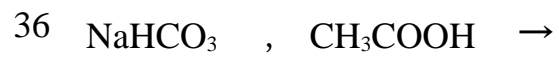
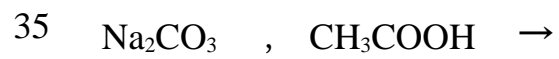
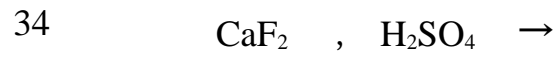
さらに高温にすると、 $HSO_4^- \rightarrow H^+ + SO_4^{2-}$  の反応が進み

最終的には、下記のようになる。

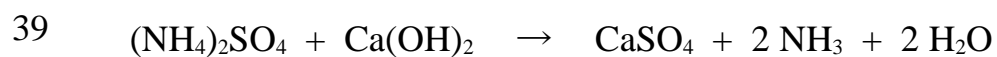
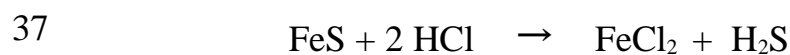
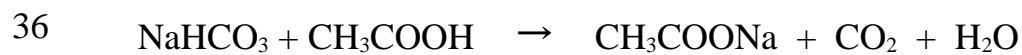
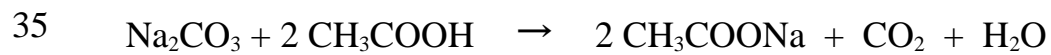




(問)



(解)



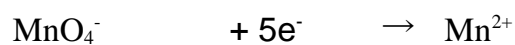
## 半反応式の作り方

0. 物質の変化と酸化数をかく。(これだけは覚えておく)  
酸化数がわからない時は、やり方2を使う。



### やり方1

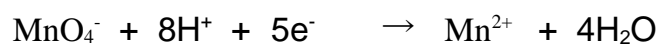
1. 酸化数の変化から、電子数を考える。



2. O の数を, H<sub>2</sub>O で合わせる。



3. H の数を, H<sup>+</sup> で合わせる。



4. 確認 (両辺の電荷を計算, 等しいはず)

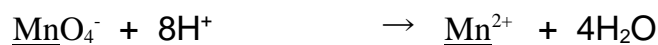
$$-1 \quad +8 \quad -5 = +2 \quad +2$$

### やり方2

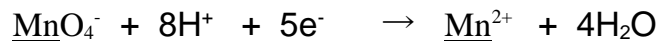
1. O の数を, H<sub>2</sub>O で合わせる。



2. H の数を, H<sup>+</sup> で合わせる。



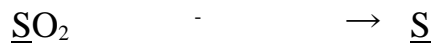
3. 電荷を, e<sup>-</sup> で合わせる。



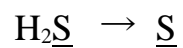
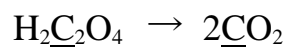
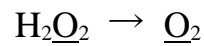
$$-1 \quad +8 \quad -5 = +2 \quad +2$$

## 半反応式をつくる

酸化剤

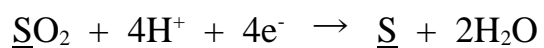
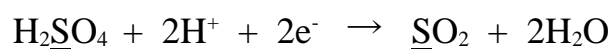
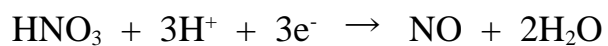
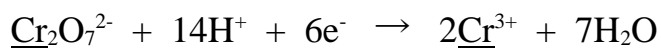
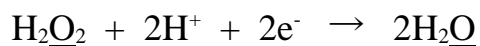


還元剤



## 半反応式をつくる (解答)

酸化剤



還元剤

