

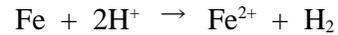
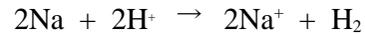
反応式の作り方 1

金属が溶けて、H<sub>2</sub> を発生する場合

(例)



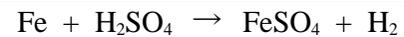
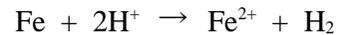
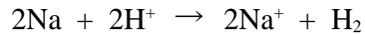
1. 金属と H<sup>+</sup> で考える。



2. 水の場合は、OH<sup>-</sup> を両辺に加える。

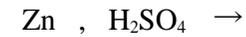
2'. 酸の場合は、酸の陰イオンを両辺に加える。

3. たし算をする。

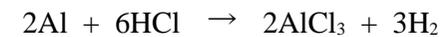
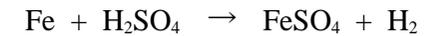
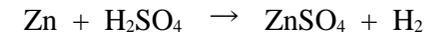
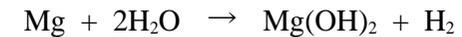
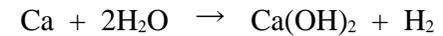
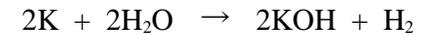
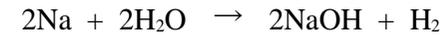


( 1 )

(問)



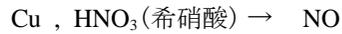
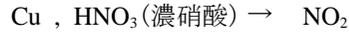
(解)



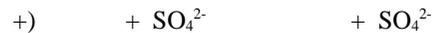
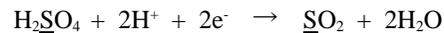
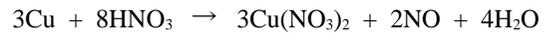
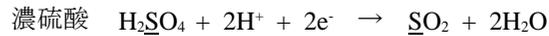
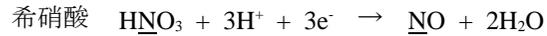
( 2 )

反応式の作り方 2

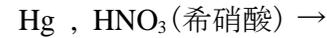
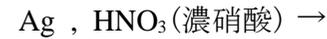
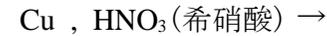
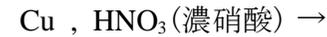
金属が溶けて、H<sub>2</sub>以外の気体(SO<sub>2</sub>,NO,NO<sub>2</sub>)を発生する場合



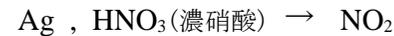
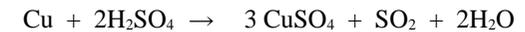
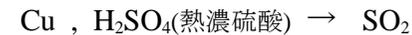
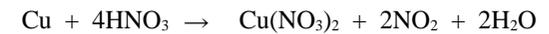
- 酸化・還元の半反応式を組み合わせる。
- H<sup>+</sup>がある場合は、酸の陰イオンを組み合わせる。



(問)



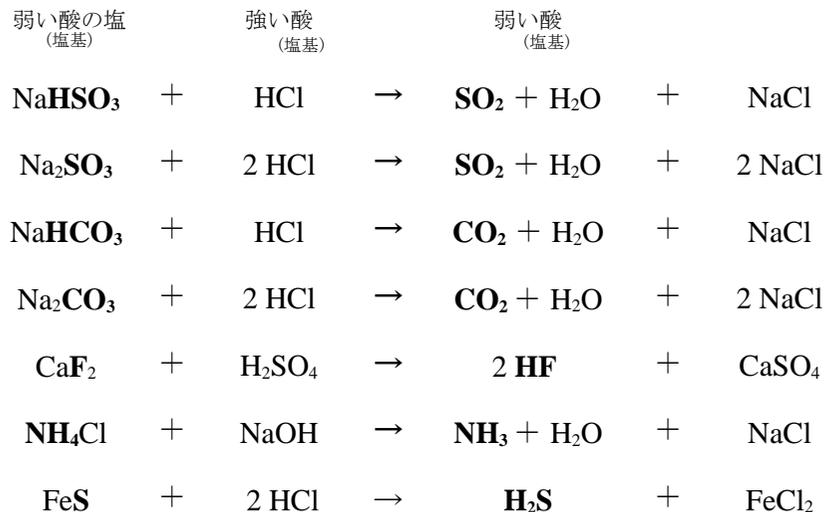
(解)



**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)



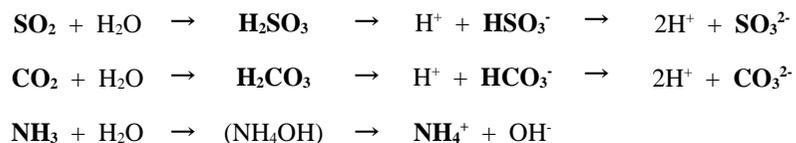
( SO<sub>2</sub>, H<sub>2</sub>SO<sub>3</sub>, HSO<sub>3</sub><sup>-</sup>, SO<sub>3</sub><sup>2-</sup> )

( CO<sub>2</sub>, H<sub>2</sub>CO<sub>3</sub>, HCO<sub>3</sub><sup>-</sup>, CO<sub>3</sub><sup>2-</sup> )

( NH<sub>3</sub>, NH<sub>4</sub><sup>+</sup> )

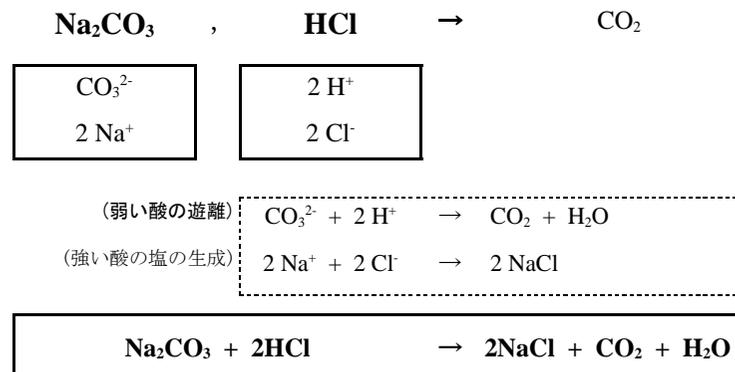
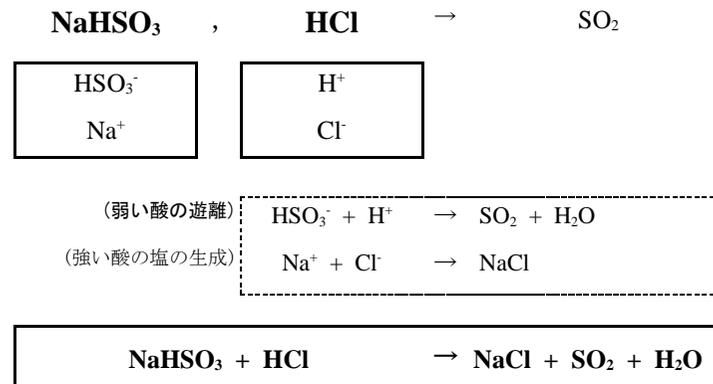
はそれぞれ同じものであると思え。

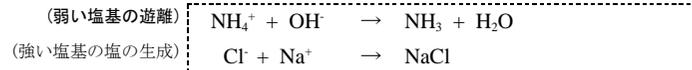
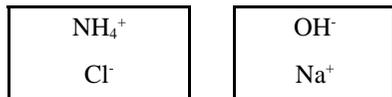
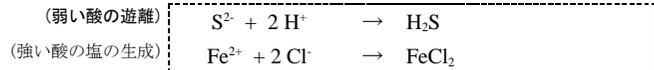
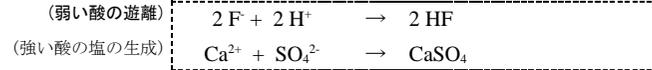
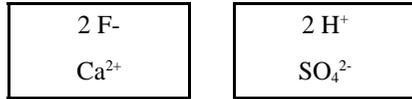
気体が水に溶けるときの反応



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。





**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

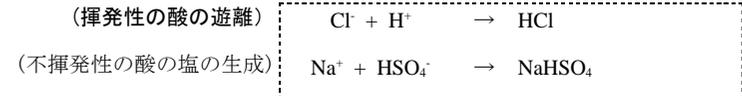
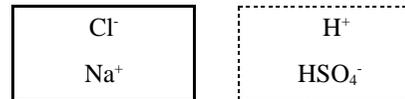
(例)

不揮発性の酸                      揮発性の酸



組み立て方

塩と酸（塩基）の電離の式を書く。

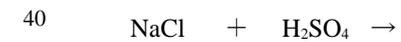
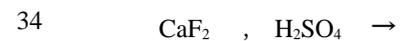


さらに高温にすると、HSO<sub>4</sub><sup>-</sup> → H<sup>+</sup> + SO<sub>4</sub><sup>2-</sup> の反応が進み

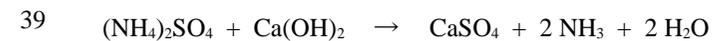
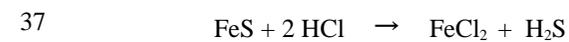
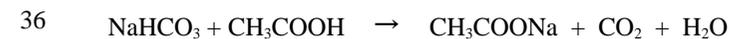
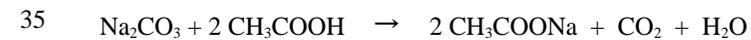
最終的には、下記ようになる。



(問)



(解)



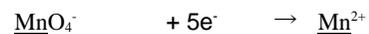
## 半反応式の作り方

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

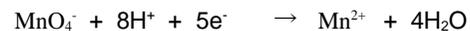
1. 酸化数の変化から、電子数を考える。



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。



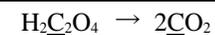
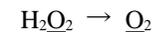
$$-1 \quad +8 \quad -5 = +2 \quad +2$$

## 半反応式をつくる

酸化剤

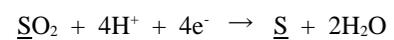
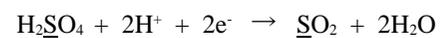
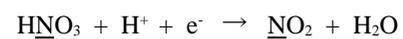
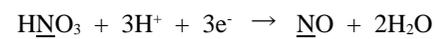
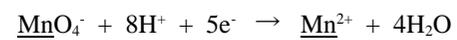
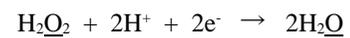


還元剤



半反応式をつくる (解答)

酸化剤



還元剤

