

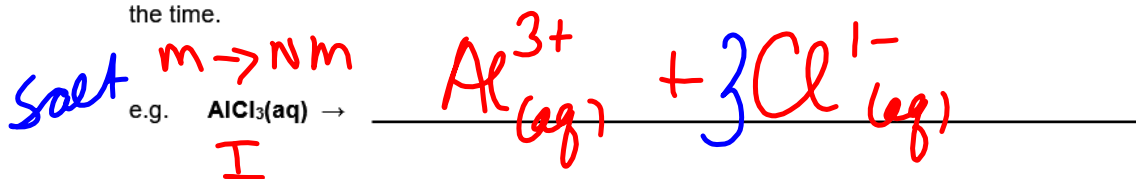
Writing Net Ionic Equations

Net Ionic Equations

- indicate only the species that are reacting
- not all species in a BCE react
- some species are present but just "watch" the other species react

Information you are to memorize:

Some substances when dissolved in water (aqueous solutions) break up into ions 100 % of the time.



The substances that break up 100 % of the time are:

- 1) salts ionic compounds $m \rightarrow Nm$ e.g. $\text{NaCl}, \text{MgF}_2, \text{FeSO}_4$
- 2) strong acids $H \rightarrow Nm$

(aq)

HCl	HNO ₃
HBr	HClO ₃
HI	HClO ₄
	H ₂ SO ₄

hydrochloric *nitric*
chloric *chloric A*
perchloric
sulfuric

3) strong bases $M \rightarrow OH$

LiOH	Ca(OH) ₂
NaOH	Sr(OH) ₂
KOH	Ba(OH) ₂
RbOH	
CsOH	

GR1A *GR2A*

Any other soluble (aqueous) ionic, acidic or basic substances **DO NOT** split up 100 % of the time.

Any soluble (aqueous) covalent substances **DO NOT** split up ever in water.

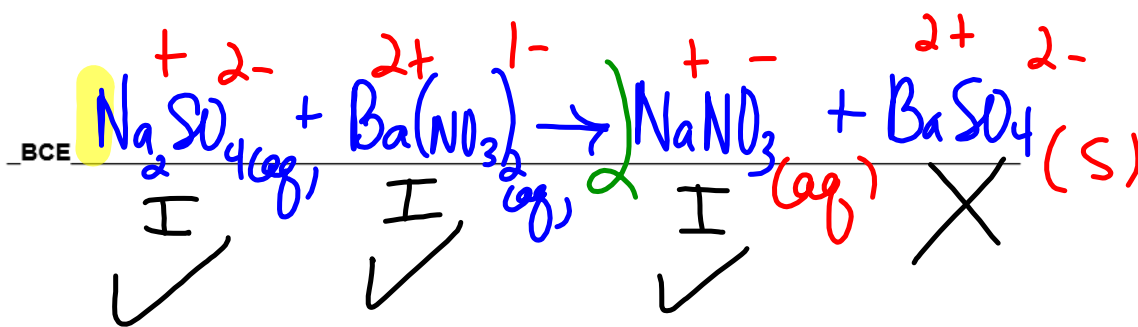
e.g. $I_2(aq)$, $C_2H_5OH(aq)$, $C_{12}H_{22}O_{11}(aq)$ etc

Solids, Liquids and Gases DO NOT split up! They are NOT aqueous.

Certain products are unstable and break apart upon formation. Two important ones that you must remember are H_2CO_3 , a weak acid that breaks up into $H_2O(l)$ and $CO_2(g)$ and NH_4OH , a weak base that breaks up into $H_2O(l)$ and $NH_3(g)$. There is absolutely no experimental evidence for the EXISTENCE of discrete molecules of either carbonic acid or ammonium hydroxide. They cannot be isolated and crystallized.

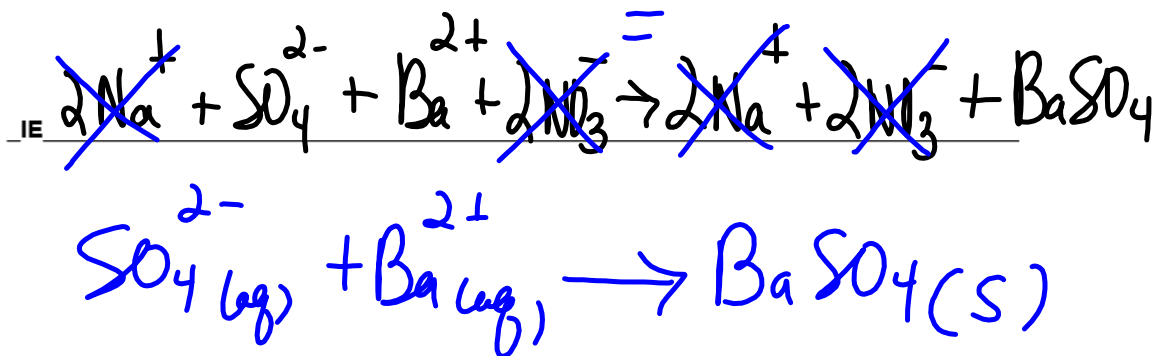
Rules for writing Net Ionic Equations

- 1) Write the **BCE** with the proper subscripts.



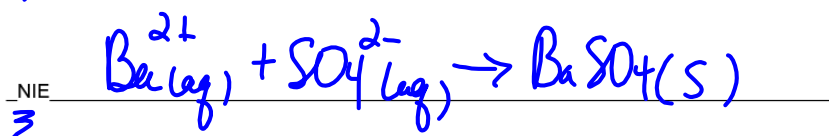
- 2) Eliminate any species that is not aqueous.
- 3) Determine whether each aqueous species is a **strong acid (SA)** or **strong base (SB)** or a **salt/ionic compound (I)**.
- 4) Separate all the compounds checked in Step 3 into ions.

This is the **Ionic Equation (IE)**.



5) Cross out any species that is common to both sides. The species must be **identical!!!!**

This is the **Net Ionic Equation (NIE)**.



The NIE indicates the species which are reacting.

The crossed out species are **SPECTATORS** -- they are present but do not react.

Examples of Spectators:

