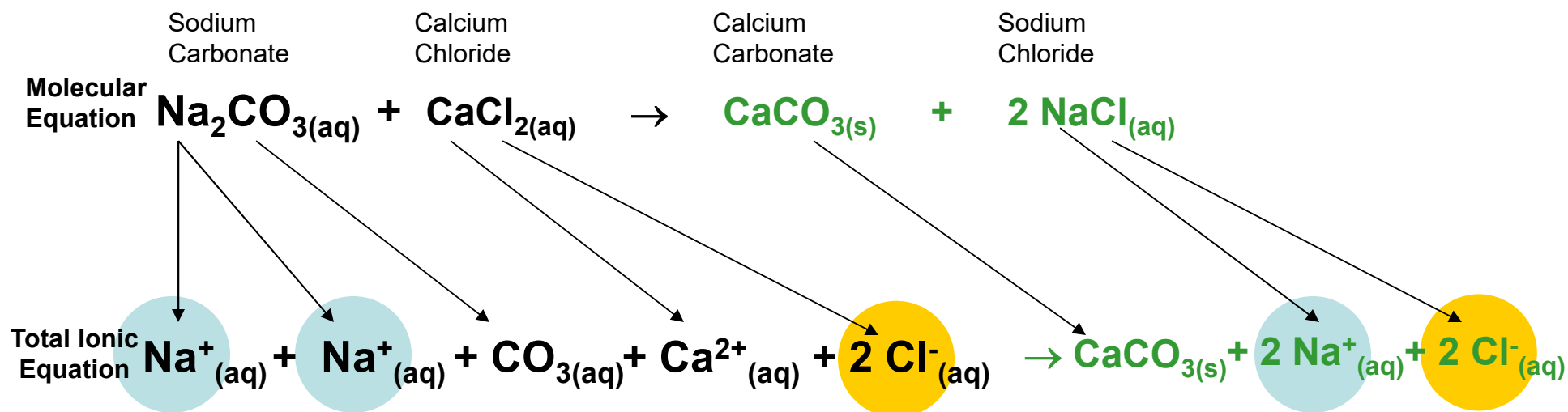


Chemical Equations

Molecular, Total Ionic
&
Net Ionic Equations



Chemical Reactions: Keeping Track: Precipitation Reactions



Spectator ions: Present but not changed during the reaction.



Spectator ions removed.

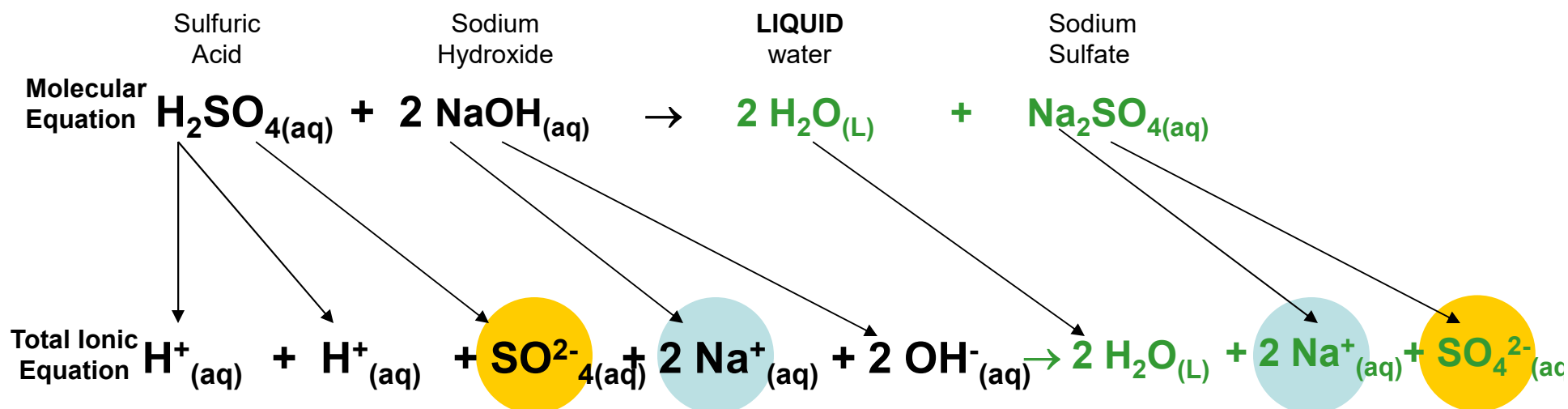
Were the spectator ions REALLY necessary???

Yes, they were originally partnered with the carbonate and calcium ions.



Chemical Reactions:

Keeping Track: Neutralization Reactions



Spectator ions: Present but not changed during the reaction.



Spectator ions removed.



Problem

Aqueous **barium hydroxide** and **sulfuric acid** solutions are mixed together.

- What products are formed?
- What are the molecular, total ionic and net ionic reactions?

Solubility Rules

| Soluble | Exceptions |
|---|---|
| Group 1A, NH_4^+ | |
| NO_3^- , CH_3COO^- , most ClO_4^- | |
| Cl^- , Br^- , I^- | Ag^+ , Pb^{2+} , Cu^+ , Hg_2^{2+} |
| F^- | Pb^{2+} , Group 2A |
| SO_4^{2-} | Ca^{2+} , Sr^{2+} , Ba^{2+} , Ag^+ , Pb^{2+} |
| | |
| Insoluble | Exceptions |
| OH^- | Group 1A, larger members of Group 2A |
| CO_3^{2-} , PO_4^{3-} | Group 1A and NH_4^+ |
| S^{2-} | Group 1A, Group 2A and NH_4^+ |
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