

Solution:

When you put sodium carbonate (Na_2CO_3) in water it produces 2 sodium ions and one carbonate ion (CO_3 with a charge of 2-).

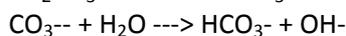
Carbonic acid (H_2CO_3) is a weak acid and doesn't want to break apart.

So what happens to the CO_3 ion in water is that it picks up one or 2 hydrogen ions to become H_2CO_3 or HCO_3^- .

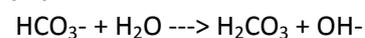
The only place CO_3 can get hydrogen ions from is water.

And if it takes a hydrogen from water (H_2O), there will be a hydroxide ion (OH^-) left over.

From the point of equations:



and



When dissolved soda produces heat (- 92.034 kJ/mol)

Calcium carbonate is insoluble in water because it is extremely stable as a solid and water doesn't have sufficient solvating capability to cause the ions to separate and come into solution.