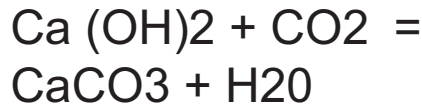


Full Cycle of Lime

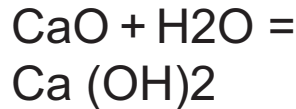
The limestone becomes limestone again (without any impurities)!!!

That is why lime is so durable, environmentally friendly and beautiful – as long as synthetics are not added to it!

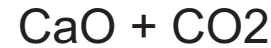
When the lime $\text{Ca}(\text{OH})_2$ is applied, the Carbonation reaction starts right away, picking up natural CO_2 molecules from the atmosphere and evaporating water:



Water is added to the unslaked lime (CaO) and allowed to slake for up to 25 months. This creates Calcium Hydroxide (putty lime).

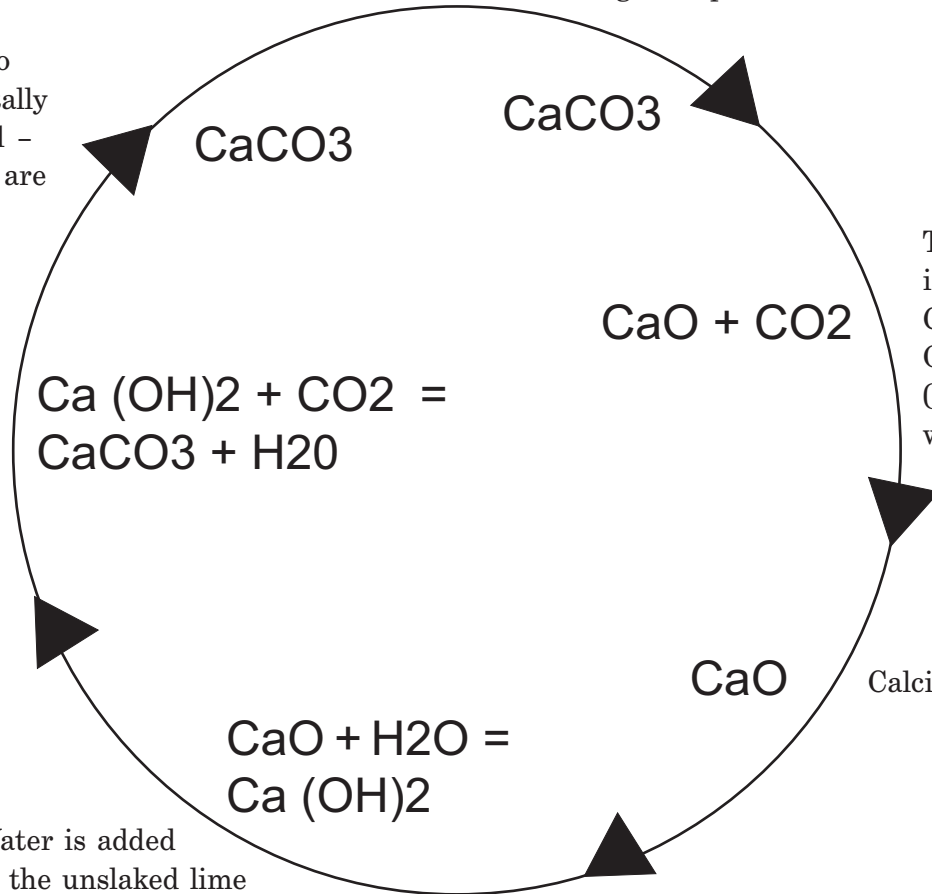


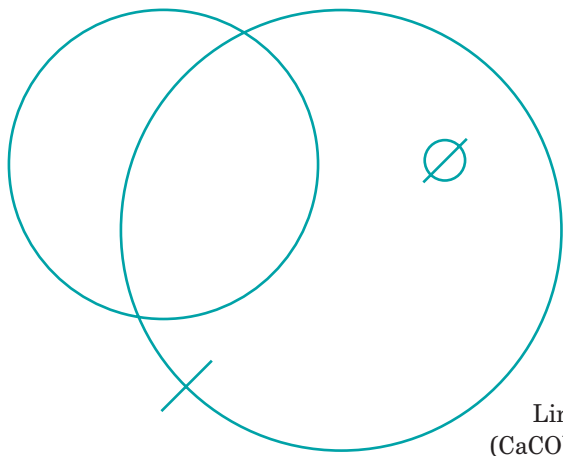
Limestone containing Calcium Carbonate (CaCO_3) is crushed and burned at high temperatures:



Calcium Oxide.

The lime CaCO_3 is converted to CaO (Calcium Oxide) + CO_2 (Carbon Dioxide) which evaporates.





Calcination of Limestone

Lime comes from limestone blocks, which are composed of carbonate of calcium (CaCO_3). The stone is crushed and burned in ovens at high temperatures of 1100° Centigrade. The carbon is burned off leaving unslaked lime (CaO).

The unslaked lime that comes out of the ovens is a porous raw material in the form of various sized small stones. It's color ranges from white to light yellow.

Transforming the Unslaked Stones into Lime

The unslaked lime (CaO) is then mixed gently and slowly with water. This reaction develops high temperatures (150° C) and increase the volume of the mix by 10%. The reaction causes the stones to crack and water vapor is released. Water is added incrementally as this occurs and carefully mixed into the “paste.”

Hydrated Lime (extrafine lime)

This is produced by carefully monitoring the water and unslaked stone mix until the exact proportion of water is the same as in limestone. It is dried and ground into powder. Hydrated lime is sold by the bag like cement. This product is extremely frost resistant.

Slaked Lime Putty (Grassello)

This formulation has a higher water content than hydrated lime (ratio 3:1). It is best described as a “fatty mass” called slaked lime putty or Grassello.

The Romans aged the lime putty in clay urns under ground immersed in water for months. Today, the lime putty is still soaked in water for up to 25 months to slake it properly. “Grassello” is sold ready to use in plastic containers.

Grip and Setting

The principal characteristic of lime, when properly mixed and applied, is that it produces substances that are durable, stable, strong and water-resistant. This characteristic is based on the chemical reaction between slaked lime and natural carbon dioxide in the atmosphere.

While the product dries, water evaporates which produces calcium carbonate of lime (CaCO_3). This is called the “carbonization reaction” meaning the lime returns to the exact chemical composition of its parent stone but with crystals much smaller than in the original stones.

The carbonating process is very slow (minimum 3 months to cure) due to the low concentration of carbon dioxide in the air. Slaked lime is always used with other natural mineral components such as marble dust or titanium to prevent cracking.