***Recipe #1** is for use in reef aquaria whose pH is normal to low. It will tend to raise pH due to its alkalinity part's elevated pH, as do most of the commercial two-part additives. The increase in pH depends on the aquarium's alkalinity and, of course, on how much is added. Adding on the order of 0.5 meq/L of alkalinity increases the pH by about 0.3 pH units immediately upon its addition*

Calcium Chloride (Calcium Two-Parts) – Recipe #1

Component:
Calcium Chloride Dihydrate – 500 grams (2.5 cups)
RO/DI – 1 Gallon

Instruction:
Dissolve 500 grams (2.5 cups) of calcium chloride into ½ gallon of RODI water. Once all of the flakes are dissolved then add the remaining ½ gallon to the mixture. This solution has about 37,000 ppm of calcium.

Sodium Bicarbonate (Alkalinity Two-Parts) – Recipe #1

Component:
Sodium Bicarbonate (Baking Soda) – 594 grams
RO/DI – 1 Gallon

Instruction:
Spread baking soda 594 grams (2 ¼ cups) on a baking tray and heat in an ordinary oven at 300°F* for one hour to drive off water and carbon dioxide. Overheating is not a problem, either with higher temperatures or longer times. Other alternative if oven is not available is frying it on a flat pan for over an hour. Spread it evenly and stirring it occasionally will ensure stable mixture. The less water and carbon dioxide baking soda is now turned into "Sodium Carbonate"

Dissolve the Sodium Carbonate with 1 gallon of RO/DI water. Making the water warm will fasten dissolution. The solution can yield up to 1,900 meq/L of alkalinity (5,300 dKh).

**The baking/frying drives some of the carbon dioxide out of the baking soda, and raises its pH as well as its alkalinity*

***Recipe #2** is for use in reef aquaria whose pH is on the high side (above 8.3 or so). It will have a very small pH lowering effect when initially added. The pH drop achieved will depend on the aquarium's alkalinity and, of course, on how much is added. Adding on the order of 0.5 meq/L of alkalinity drops the pH by about 0.04 pH units immediately upon its addition.*

Calcium Chloride (Calcium Two-Parts) – Recipe #2

Component:
Calcium Chloride Dihydrate – 250 grams (1 ¼ cups)
RO/DI – 1 Gallon

Instruction:
Dissolve 250 grams (1 ¼ cups) of calcium chloride into ½ gallon of RODI water. Once all of the flakes are dissolved then add the remaining ½ gallon to the mixture. This solution is about 18,500 ppm of calcium.

Sodium Bicarbonate (Alkalinity Two-Parts) – Recipe #2

Component:
Sodium Bicarbonate (Baking Soda) – 297 grams (1 1/8 cups)
RO/DI – 1 Gallon

Instruction:
Dissolve 297 grams (1 1/8 cups) of baking soda in 1 gallon of RO/DI water. Making the water warm will fasten dissolution. The solution can yield up to 950 meq/L of alkalinity (2,650 dKh).

Magnesium

Component:
Magnesium Sulfate (Epsom Salt) - 25.5 grams
Magnesium Chloride - 246.5 grams
RO/DI Water – 946ml

Instruction:
Divide the water into 2 parts (473ml per container). Dissolve the Magnesium Sulfate on the first container and the Magnesium Chloride on the other one. Stir 'til there are no visible residues. Mix the two solutions after several minutes. Use a paper filter or filter funnel to separate precipitate.

Dissolving the 2 component separately will lessen the chances of precipitation but there will likely be a precipitate that forms even if you fully dissolve both ingredients separately. That precipitate is calcium sulfate (calcium as an impurity in the magnesium chloride and sulfate from the Epsom salts).

Calcium Hydroxide (Kalkwasser Dosing)

Recipe for tank which have enough free carbon dioxide (CO2) in the water

Component:
Calcium Hydroxide – 5 grams (1 teaspoon)
RO/DI Water – 1 Liter (1000ml)

Instruction:
Mix RO/DI water and 5 grams of Calcium Hydroxide (kalkwasser) the day before and let it sit for 24 hours or so. There will be film layer that will develop on top. There will also be sediment in the bottom of the container. You only need to collect the clear liquid in the middle. You don't want to remove the residue from the top, but you also don't want to add it to your tank -- it acts as a kind "seal" preventing the kalkwasser from reacting with CO2 in the atmosphere and losing potency. For this reason you also want to store kalkwasser in a sealed container.

Recipe for tank which have carbon dioxide (CO2) deficiency in the water

Component:
Calcium Hydroxide – 5 grams (1 teaspoon)
RO/DI Water – 1 Liter (1000ml)
Acetic Acid (Distilled Vinegar) – 15ml

Instruction:
Pour 15ml of 5% Acetic Acid (or ordinary Distilled White Vinega) into a 1 liter container. Dissolve 5 grams of calcium hydroxide in the Acetic Acid, and then dilute to 1 liter of RO/DI water