✓ **Check list**

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KH (carbonate hardness / Alkalinity) and pH value

Before each action, please check the KH value or pH value. Regularly check the drop tests with a standard = reference solution or a second new test! Often enough aquariums have been treated incorrectly because tests have indicated a wrong value.

The two parameters pH and KH are closely related to each other and are therefore treated together here. Generally speaking, the higher the KH value, the more stable and higher the pH value.

The pH value should always be measured before the lighting is switched on and shortly before it is switched off in order to determine the daily oscillations. If this is not possible in terms of time, measurements should always be taken at the same time.

Too low pH (less than 8.0) and KH (less than 6°dH):

Action: If the KH-value is below 6°dH, then it must absolutely be raised slowly to the normal measure of 7-8°dH - in stony coral aquariums without phosphate deficiency (PO4 higher 0.05 mg/l) also gladly up to 10-12°dH.

Possible means:
    Carbonate powder (e.g. Super Buffer)
    Carbonate liquid for small aquariums (e.g. KH-plus)
    Lime reactor (e.g. *Turbo* Chalk Reactor)

Action: Ensure that mud corners or very compacted soils with sediment do not form. In mulm corners, the carbonate hardness is "eaten up" by acid formation and the pH value drops.

Possible means:
    Introduce bottom-digging animals: burrowing snails and sea urchins (sand dollars), suitable fish.
    Do not use a bottom substrate. But then many animals are not sustainable: gobies, many wrasses, mandarin fish and other animals that seek food in the bottom.
    Adjust or increase the flow so that a complex pattern is created and mulm corners are regularly stirred up and the particles enter the filter system. It also improves gas exchange with the ambient air.
    Regular partial cleaning of the bottom. Use a suction cup to clean the substrate without digging through the substrate. Clean no more than 20% of the bottom surface per week. It is best to combine this with a partial water change.
    If you use a filter that is completely filled with water (pot filter), it must be roughly cleaned once a week. The same applies to particle filters: filter socks, quick filters, cartridge filters. Fleece filters clean automatically. Sand filters must be rinsed daily.

Only too low pH (less than 8.0) - KH is o.k.

Action: bottom and filter care and current: see above

Action: Aquarium covers should be avoided if possible. If it is only a question of preventing fish from jumping out, it is better to use a jump screen in form of a grid or net.
If the cover has a ventilation system in operation, it can be reused without any problems.

Action: Increase the air volume of the skimmer to improve gas exchange: a larger or different model. Models with increased air retention time are also possible.

Action: Install a lime water reactor or use the lime water method manually. Only in cases of very high carbon dioxide concentrations in the water the carbonate hardness can also increase. The lime water method should also not be used if the calcium values are too high. If a lime reactor or a calcium dosing system is also used, the outputs of the systems must not be dripped into the filter basin at the same place or at the same time.

Action: Check the lime reactor. It may have to be equipped with a neutralization stage. Alternatively, a system with an integrated neutralization stage can be used (e.g. *Turbo* Chalk Reactor).

Action: The aquarium room should be regularly and well ventilated to avoid too high CO_2 concentrations in the air. Especially in winter, in well-insulated homes, this point is important. A ventilation system with heat exchanger would be the best solution.

Action: Install a CO_2 adsorber (" breathing lime ") in front of the air intake of the skimmer. The CO_2 contained in the air can then no longer acidify the water. This method lowers the pH value by approx. 0.2-0.3°dH.

Action: a refugium heavily planted with e.g. algae or seagrass can be illuminated at night. This anti-cyclical lighting reduces the daily pH fluctuation.

KH value too high (greater than 10°dH)

Action: Reduce the output of the lime reactor or the carbonate hardness dosing system.

Action: If a lime water system is installed, this can be the cause under unfavorable circumstances. Switch off the system and observe the carbonate hardness over the next week. If it does not drop, please restart the system.

Action: Check the carbonate hardness of the seawater used for the water change. If necessary, select a salt with less carbonate hardness.

Action: Moderate water changes with low KH seawater.

Too high pH value (greater than 8.5)

Action: Ammonium should be measured at pH values above 8.2. If this is in the measurable range, caution is advised. For more accurate information, use an ammonia calculator: https://www.aquacare.de/index.php/aquaristik/aquaristik-info/parameter/ammoniak-rechner.html

Action: Do not use a CO_2 adsorber before the air intake of the skimmer.

Ammoniak-Rechner

Action: Reduce the neutralization capacity of the lime reactor.

Action: Turn off the lime water dosage.