AQUACULTURE
FEED & EQUIPMENT

BNH

PRODUCT #
T00110

氨氮 / 亞硝酸 / 溶氧 / PH / 4 合 1 水質測試劑

WATER QUALITY TESTER SET (4 IN 1)

T00110

要設置一個水族箱飼養觀賞魚並不困難，但是要提供穩定的水質讓觀賞魚生活在一個舒適的水族環境，卻不是一件容易的事，最主要是原因是觀賞魚會產生數量相當可觀的排泄物，雖然高效率的過沪系統會除去大部分的排泄物，但仍有少部分會在水中產生耗氧性的分解並生成有毒物質，當這些有毒物質在水中持續累積，且達到魚類難以忍受的程度時，可能導致魚類大量死亡。
許多水族愛好者通常會在他們的水族箱中飼養很多的魚，相對的，因排物所造成的水質污染問題也日益嚴重，若未能妥善處理，魚類發生疾病或中毒的意外事件之機會將大幅提昇。污染問題所造成的意外事故，因素很多，其中最重要者有下列三種：
(1) 溶氧不足，(2) 氨中毒，(3) 亞硝酸鹽中毒。
它們都是水族箱中的隱形殺手，如果不事先加以防治，等於讓魚類生活在一個不健康的環境，隨時都有生病及死亡之危險。
水族界有一句名言『養魚先養水』，充份說明魚的健康與否和水質息息相關。
瞭解水質就要靠水質檢測產品了。本測試組合是一套簡易的測試工具，可用於測定水族箱中的溶氧，氨及亞硝酸鹽之正確濃度，其測定結果不僅可以作為改善及控制水質之依據，同時亦可協助您做好『養水』的工作，使您在飼養過程中事半功倍、順利成功，進而達到飼養的樂趣。

使用說明：

一、溶氧測試：

1. 試劑組成：分 A、B、C、D 共四劑 (容積 4x10ml)
2. 使用方法：
   (1) 先用測試杯取水樣 10~15ml。
   (2) 依序加入測試劑 A 和測試劑 B 各 5 滴於水樣中。注意！不要搖動水樣！此步驟有淡黃色沉澱產生。
   (3) 立刻沿杯壁再追加水樣至剛好滿杯 (總容積約 27.5ml)，並確定倒進杯中時沒有氣泡產生！然後小心將杯蓋蓋好，以防止水樣再接觸到空氣。
   (4) 靜置試水約 10 分鐘，讓沉澱物下降至杯底，同時沉澱物也因發生化學反應而變成淡褐色。
   (5)10 分鐘後，將杯蓋打開，並將沉澱物上水層之液體倒掉一些，使總容積只剩下 10~15ml。注意！不要將沉澱物也傾倒出來！
   (6) 立刻加滴 5 滴測試劑 C，搖動 30 秒，使沉澱物溶解，若未完全溶解，請再追加 1 滴。
   (7) 慢慢搖晃測試杯，同時開始滴加 D 劑。每加一滴都需小心觀察其顏色的變化，直到水色由黃褐色變為無色時，立刻停止滴加，並記下總共滴數。

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3. 結果分析：
   (1) 本測試劑之 D 劑每滴加一滴相當於溶氧 0.5ppm 之濃度。
   (2) 溶氧量可由 D 劑之總滴數決定。例如，總共滴加 14 滴，則溶氧的濃度為 0.5ppmx14 = 7ppm。
   (3) 淡水之測試，在 25℃時，若溶氧量低於 4ppm 以下表示危險，約 5ppm 表示理想。
   (4) 海水之測試，在 25℃時，若溶氧量低於 3ppm 以下表示危險，約 5ppm 表示理想。
4. 補救方法：
   (1) 溶氧量缺乏時，請充分曝氣。
   (2) 找出溶氧不足的可能原因，例如，魚太多或食物太多，並謀求改善。

二、氨測試：

第一部份：NH4/NH3 測試

1. 試劑組合：分 A、B、C、D 共四劑 (容積 3 x10 ml，0.6g)
2. 使用方法：
   (1) 用測試杯裝 5ml 水樣。
   (2) 加入 A 劑 5 滴並搖勻。
   (3) 加入 B 劑 5 滴並搖勻。
   (4) 加入 C 劑 5 滴並搖勻。
   (5) 加入 D 劑少量 (請用所附藥匙尾端搖一小匙) 並搖勻使其完全溶解。
   (6) 靜置 15 分鐘後由溶液的呈色與色標對照進行比色，讀出測試值。

第二部份：pH 測試

1. 試劑組合：僅有一劑 (容積 1x10ml)
2. 使用方法：
   (1) 用測試杯裝 5ml 水樣。
   (2) 加入 pH 試劑 5 滴於水樣中，搖動之，再由溶液的呈色與色標對照進行比色，讀出 pH 值。

第三部份：綜合說明

(1) 水中的氨主要從細菌分解蛋白質而來，如：魚的排泄物、殘餌、魚的屍體分解等。
(2) 本測試組合所得到的測試值為水中之總氨態氮，亦即包含銨 (NH4) 及氨 (NH3) 的總濃度。
(3) 氨 (NH3) 有毒，而銨 (NH4) 無毒，兩者之間可在水中互相轉換，但轉換情形會受 pH 的影響。
(4) 當 pH 愈高時，愈有利於氨 (NH3) 之形成；反之，若 pH 愈低時，愈有利於銨 (NH4) 之形成。由此可知，水中所含有毒氣 (NH3) 的百分率會隨著 pH 值
(5) 在酸性中 (pH < 7) 所有的氨幾乎全部變成銨。
(6) 在 25℃時有毒氨含量與 pH 的關係如下：

氨含量 (%)	0	0	1.5	3.5	5.5	10	20	35
PH	6.4	6.8	7.2	7.6	8.0	8.4	8.8	9.2

第四部份：結果分析

(1) 請由 NH4/NH3 測試值配合 pH 測試值，決定氨的濃度。例如，若銨測試值為 2ppm 以及 pH 值為 7.6 時，氨的濃度等於 2ppm X 0.035 = 0.07ppm。
(2) 氨的濃度在 0.05~0.5ppm 時表示危險，在 0.2 ~ 0.5 ppm 時會導致魚類急性中毒而迅速死亡，0ppm 表示 理想。

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第五部份：補救方法

(1) 氨濃度偏高時，請用酸液調降 pH 值或部份換水。
(2) 找出氨偏高的可能原因，例如是否硝化細菌 (nitrify-ing bacteria) 不足，並謀求改善。

三、亞硝酸鹽測試：

1. 試劑組合 : 僅有一劑 (容量 1 x 15g)
2. 使用方法 :
   (1) 用測試杯裝 5ml 水樣。
   (2) 加入一匙粉劑於水樣中，搖晃之使其溶解，由溶液的呈色與色標對照進行比色，讀出濃度。
3. 綜合說明 :
   (1) 水中的亞硝酸鹽主要從銨 / 氨轉變而來，是細菌分解蛋白質的中間產物。
   (2) 亞硝酸鹽通常會導致魚隻食慾不振、體色變淡、缺氧、易感染疾病等，因此常常檢測水中之亞硝酸鹽是非常重要的
4. 結果分析 :
   (1) 測定值低於 0.3ppm 表示安全，介於 0.5~2.0ppm 表示危險，高於 2ppm 表示非常危險。
   (2) 測定值若偏高，表示硝化作用 (nitrifying action) 不理想，間接會造成氨中毒機會的增加。
5. 補救方法 :
   (1) 亞硝酸濃度偏高時，請部分換水。
   (2) 請在養殖池中添加硝化細菌。

四、備註：

1. 每次要作測試之前，請先用待測試之水洗丞測試杯數次再進行 試驗。
2. 測試劑用過之後，請立即蓋好測試劑瓶蓋。
3. 首次開瓶後，TBS 測試劑保證使用期限 12 個月以上。
4. 包裝盒上的色標請盡量防止日光直接曝晒，不用時請避光保存。
5. 本測試組合為化學試驗，絕對避免孩童拿取 !

English:

To set up an aquarium ornamental fish breeding is not difficult, but to provide a stable water quality so that fish living in a Comfortable aquarium environment, that is an easy task ,because the most important is the number of fish will generate considerable Waste, although the high efficiency over waste remove most of the waste system , but still small portion in the water Aerobic decomposition and generation of toxic substances , when these toxic substances continue to accumulate in the water , and the fish is difficult to achieve Intolerable extent, may cause massive death of fish . Many aquarists usually kept a lot of their aquarium fish , relative, because the water quality caused isostere Increasingly serious pollution problems , if not properly handled , fish occurrence of disease or poisoning accidents opportunities will be significantly Promotion. Pollution problems caused by accidents,many factors, most important of which are the following three :

(1) lack of oxygen , (2) ammonia poisoning , (3) nitrite poisoning .

They are in the aquarium invisible killer , if not prior to combat , is tantamount to living in an unhealthy fish Environment , illness and death have always dangerous. Sector has a famous aquarium " fish before raising water ," or not fully explain the health of fish and water quality are closely related. Learn to rely on water quality testing product. This test is a simple combination of testing tools can be used to determine the Aquarium dissolved oxygen , ammonia and nitrite concentration is correct , not only as a result of its determination to improve and control of water

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quality Basis , but will also help prepare you for " raising water / culture of water" work , allowing you to do more with less in the breeding process , smooth and successful, Thus achieving the rearing of fun.

TBS Water Quality Tester Set:

Dissolved Oxygen level testing 1. Tester set: A, B, C, and D (4*10ml) ;

2. Direction:

(1) Collect 10-15ml of the tested water into the beaker, make sure there is no air bubble while pouring.

(2) Add in 5 drops of A and 5 drops of B into the tested water. (Do not shake the solution at this stage!) There should be light yellow precipitant formed.

(3) Add in more sampled water into the beaker until the water level has reached the top beaker (The total volume should be approximately 27.5ml). Pour the water in along the edge of the to avoid air bubbles from getting into the beaker. Close the lid tightly to prevent further contact with the air.

(4) Let the solution stand for 10 minutes until the precipitant all settle at the bottom of the beaker.The precipitant should now turn into light brown color due to chemical reaction.

(5) Open the lid and pour out the solution until there is only 10-15ml of solution remaining in the beaker. Make sure you leave the precipitant in the beaker, don't pour them out!

(6) Add in 5 drops of C and lightly shake the solution for 30 seconds to dissolve the brown precipitant, if the precipitant is not totally dissolved, add in one more drop of C.

(7) Lightly shake the solution while adding in D one drop at a time. Carefully observe the color changes; stop adding in D when the solution turns from yellow to transparent. Record the number of drops added.

3. Result Analysis:

(1) One drop of D is equivalent to 0.5ppm of dissolved oxygen.

(2) Dissolved oxygen level can be calculated according to the total number of drop added. For example, if the total number of drop added is 14, the dissolved oxygen level of the water is 0.5ppm x 14= 7ppm.

(3) For freshwater (under 25 degree Celsius), the dissolved oxygen level is most ideal at 8ppm. The water level is unhealthy if the dissolved oxygen level is below 4ppm.

(4) For saltwater (under 25 degree Celsius), the dissolved oxygen level is most ideal at 5ppm. The water level is unhealthy if the dissolved oxygen level is below 3ppm.

4. Rescue Action:

(1) If the dissolved oxygen level is below standard, expose the water to air.

(2) Find out the element that is causing the low dissolved oxygen level and seek improvement, for example: too many fish, too much food...etc. Ammonia level testing Part I : Ammonium level testing

1.tester set: A, B, C, and D(3*10ml, 0.6g)

2. direction:

(1) Collect 5ml of the tested water into the beaker.

(2) Add in 5 drops of A. Shake the solution well.

(3) Add in 5 drops of B. Shake the solution well.

(4) Add in 5 drops of C. Shake the solution well.

(5) Add in a little bit of D (use the handle end of the spoon to collect D). Shake the solution well to dissolve D.

(6) Let the solution stand for 15 minutes. Compare the color of the solution to the color chart and make note of the reading value corresponding to that color.

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Part II : pH level testing

1.Tester set: only one tester (l*10ml)

2. Direction:

(1) Collect 5ml of the tested water into the beaker.

(2) Add in 5 drops of the tester and shake the solution well. Compare the color of the solution to the color chart and make note of the reading value of the pH level corresponding to that color.

Part III : Explanation

(1) Ammonia come from dissolved protein, residual baits, and dead fishes.

(2) The tested value stands for the total ammonia which indicates the total NH4 / NH3.

(3) "Ammonia; NH3" is toxic, but "Ammonium; NH4 is not. These two can transform into each other in the water affecting by the pH level.

(4) The higher the pH level is, the easier it is for ammonia (NH3) to form. Vice versa, the lower the pH level is, the easier it is for ammonium (NH4) to form. Therefore, the toxic ammonia (NH3) level increased as the pH level increases.

(5) In acid (pH< 7), almost all the ammonia will turn into ammonium.

(6) The relationship table of the ammonia level and the pH level.

pH level	ammonia level
6.4	0%
6.8	0%
7.2	1.5%
7.6	3.5%
8.0	5.5%
8.4	10%
8.8	20%
9.2	35%

Part IV : Result Analysis

(1) Use the ammonium level and the pH level of the water to determine the ammonia level. For example, if the ammonium level is 2ppm and the pH level is 7.6, the ammonia level will be 2ppm X 0.035 = 0.07ppm.

(2) The water is toxic if the ammonia level is between 0.2-0.5ppm. In this environment, the fish can be poisoned immediately and die. If the ammonia level is between 0.05-0.2ppm, it is dangerous. 0ppm is most ideal.

Part V : Rescue action

(1) When the ammonia level is too high, use acid to lower the pH level or change part of the water.

(2) Find out the reason causing the high ammonia level and seek improvements. For example, check to see if the nitrifying bacteria level is sufficient.

Nitrite level testing

1. Tester set : only one tester (l*15g)

2. Direction :

(1) Collect 5ml of the tested water into the beaker.

(2) Add in one spoon of the tester. Shake the solution well to dissolve the tester. Compare the color of the solution to the color chart and make note of the reading value of the nitrite level corresponding to that color.

3. Explanation :

(1) Nitrite is transformed from NH4/NH3, and is a middle product when bacteria decompose protein.

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(2) Nitrite usually causes the symptoms such as, fishes in bad appetite, fading body colors of fishes, insufficient oxygen level, vulnerable to fish disease. So, nitrite test is a very important work.

4. Result analysis:
   (1) Nitrite level is most ideal at 0.3ppm or lower. If the nitrite level is between 0.5-2.0ppm, the water is not healthy. If the nitrite level is higher than 2ppm, it is very dangerous.
   (2) If the nitrite level is too high, it means that the nitrifying action is not performing well. This will indirectly cause the increase of the ammonia poisoning.
5. Rescue action:
   (1) Change part of the water when the nitrite level is too high.
   (2) Add in more nitrifying bacteria into the farm.

NOTE:
1. Wash the beaker with the sample water several times before starting testing.
2. Close the lid of the tester tightly right after using the tester.
3. The expiration date of the tester is 12 month after the first opening of the tester bottle.
4. Avoid direct sunlight to the color chart attached with the package. When not using the tester, make sure the package is out of the way of direct sunlight as well.
5. Keep out of the reach of children.

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TESTER

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