Ammonia Nitrogen

0 to 2.5 mg/L as NH_3–N

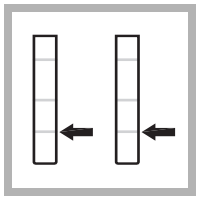
For test kit 2428700 (NI-SA) DOC326.98.00007

Test information

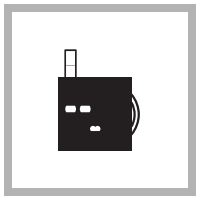
- Assemble the color comparator by placing the color disc on the center pin with the lettering facing out.
- Rinse viewing tubes with the sample water before testing. Rinse with deionized water after testing.
- Use sunlight or a lamp as a light source when matching colors with the color comparator.
- To check accuracy, use a standard solution in place of the sample (see Optional items).
- This test is very sensitive to contamination. If results are unusually high or inconsistent, run the test twice. Rinse the tubes thoroughly with fresh sample before the second test. The reagents will clean the tubes during the first test. A lower result on the second test indicates contamination during the first test.
- This test kit is designed for seawater. If used for brackish or fresh water, this kit will give a reading that is slightly higher than the actual value. The error in brackish water will in most cases be less than 10%. The error in low salinity or fresh water can be as high as 16%.
- The upper range of this test can be extended to 5 mg/L NH_3–N by diluting the sample before beginning the test procedure. Use a 3-mL syringe to add 2.5 mL sample and 2.5 mL deionized water to each tube. Follow the test procedure and multiply the result by 2 to obtain the result in the undiluted sample.

CAUTION: Handle chemical standards and reagents carefully. Review Material Safety Data Sheets for safe handling, storage and disposal information.

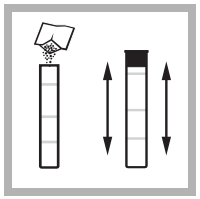
Test procedure



1. Fill two tubes to the first (5-mL) line with sample.

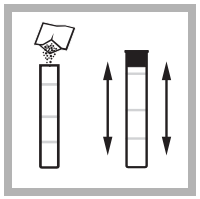


2. Insert one tube into the left opening of the comparator.



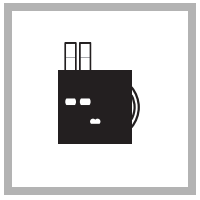
3. Add one ammonia salicylate powder pillow to the other tube. Cap and shake until all powder is dissolved.

4. Wait 3 minutes.

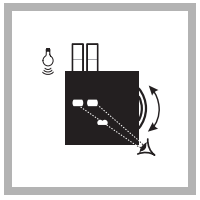


5. Add one ammonia cyanurate powder pillow to the same tube. Cap the tube and shake until all powder is dissolved.

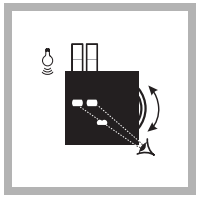
6. Wait 15 minutes.



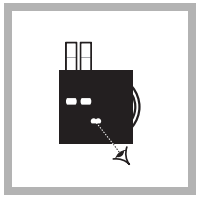
7. Insert the tube into the right opening of the comparator.



8. Hold the comparator so that a light source is directly behind the tubes.



9. Rotate the color disk until the colors in the front windows match.



10. Read the result (in mg/L) in the scale window.

Required items

Description	Unit	Catalog no.
Color Comparator Box	each	173200
Color Disk, ammonia salicylate, 0–3.0 mg/L	each	2393800
Color Viewing Tube, glass	6/pkg	173006
Stoppers, for glass viewing tubes 1730-06	6/pkg	173106
Ammonia Salicylate Reagent Powder Pillows	100/pkg	2395266
Ammonia Cyanurate Reagent Powder Pillows	100/pkg	2395466

Optional items

Description	Unit	Catalog no.
Ammonia Standard Solution, 1.0 mg/L as NH_3–N	500 mL	189149
Deionized Water	500 mL	27249
Syringe, 3-mL	each	4321300

Ammonia exists in water in two forms, un-ionized ammonia (NH_3) and the ammonium ion (NH_4^+). NH_3 is toxic to fish, while NH_4^+ is nontoxic (except at extremely high levels). At a neutral pH and ambient temperature, almost all of the ammonia exists as NH_4^+. As the pH and temperature increase, the proportion of NH_3 increases (see Table 1). This test kit measures both ammonia forms as ammonia nitrogen (NH_3–N). Use Table 1 and equations (1) and (2) to determine the amount of NH_3 and NH_4^+ in the sample.

Table 1 Percent NH_3 at different pH and temperature values

pH	Temperature °C								
	16	18	20	22	24	26	28	30	32
7.0	0.29	0.34	0.39	0.46	0.52	0.60	0.69	0.80	0.91
7.2	0.46	0.54	0.62	0.82	0.83	0.96	1.10	1.26	1.44
7.4	0.73	0.85	0.98	1.14	1.31	1.50	1.73	1.98	2.26
7.6	1.16	1.34	1.55	1.79	2.06	2.36	2.71	3.10	3.53
7.8	1.82	2.11	2.44	2.81	3.22	3.70	4.23	4.82	5.48
8.0	2.86	3.30	3.81	4.38	5.02	5.74	6.54	7.43	8.42
8.2	4.45	5.14	5.90	6.76	7.72	8.80	9.98	11.29	12.72
8.4	6.88	7.90	9.04	10.31	11.71	13.26	14.95	16.78	18.77
8.6	10.48	11.97	13.61	15.41	17.37	19.50	21.78	24.22	26.80
8.8	15.66	17.73	19.98	22.41	25.00	27.74	30.62	33.62	36.72
9.0	22.73	25.46	28.36	31.40	34.56	37.83	41.16	44.53	47.91
9.2	31.80	35.12	38.55	42.04	45.57	49.09	52.58	55.99	59.31
9.4	42.49	46.18	49.85	53.48	57.02	60.45	63.73	66.85	69.79
9.6	53.94	57.62	61.17	64.56	67.77	70.78	73.58	76.17	78.55
9.8	64.99	68.31	71.40	74.28	76.92	79.33	81.53	83.51	85.30
10.0	74.63	77.35	79.83	82.07	84.08	85.88	87.49	88.92	90.19
10.2	82.34	84.41	86.25	87.88	89.33	90.60	91.73	92.71	93.58

To determine the amount of toxic ammonia in the sample, use equation (1):

$$(1)\quad \frac{\text{mg/L } NH_3\text{–N} \times \text{value from Table 1}}{100} \times 1.2 = \text{mg/L } NH_3$$

To determine the amount of ammonium ion in the sample, use equation (2):

$$(2)\quad \frac{\text{mg/L } NH_3\text{–N} \times (100 - \text{value from Table 1})}{100} \times 1.3 = \text{mg/L } NH_4^+$$

For technical assistance or ordering information: visit www.hach.com, call 800-227-4224 or email techhelp@hach.com Edition 1, August 2006