Calculating Unionized Ammonia using Test Kits

Step 1 Use a water test kit to measure ammonia. The sampling result from the kit is reported as (Total) Ammonia Nitrogen
Step 2 Measure water temperature.
Step 3 Measure water pH.
Step 4 Find the multiplication factor in the Table below using the water temperature and pH.
Step 5 Multiply the Total Ammonia Nitrogen (step 1) and the factor from Table (step 4). The answer is the unionized ammonia nitrogen in mg/L.

An example of how to calculate Unionized Ammonia using the factors found in the Table

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Step 1 Assume Ammonia Nitrogen (sample result) was 0.025 mg/l. (measured with test kit)
Step 2 Water temperature was 57°F (14°C)
Step 3 Water pH was 7.6
Step 4 The multiplication factor from Table is 0.01 (this is where the pH in the left-hand column intersects the temperature listed across the top of the chart)
Step 5 Ammonia Nitrogen multiplied by conversion factor from Table = Unionized Ammonia (0.025 X 0.01)

Interpretation - The toxic ammonia (unionized ammonia) present is 0.0003 mg/l = *well below* threshold level of 0.025 mg/l
Unionized Ammonia of 0.05 mg/L may harm fish. As Unionized Ammonia approaches 2.0 mg/L, fish will begin to die.

NOTES: _____

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Fraction of unionized ammonia in aqueous solution at different pH values and temperatures. Calculated from data in Emmerson, et al. (1975). To calculate the amount of unionized ammonia present, the Total Ammonia Nitrogen must be multiplied by the appropriate factor selected from this chart using the pH and temperature from your water sample.

	Temperature													
pH	42.0 (ºF)	46.4	50.0	53.6	57.2	60.8	64.4	68.0	71.6	75.2	78.8	82.4	86.0	89.6
	6 (ºC)	8	10	12	14	16	18	20	22	24	26	28	30	32
7.0	.0013	.0016	.0018	.0022	.0025	.0029	.0034	.0039	.0046	.0052	.0060	.0069	.0080	.0093
7.2	.0021	.0025	.0029	.0034	.0040	.0046	.0054	.0062	.0072	.0083	.0096	.0110	.0126	.0150
7.4	.0034	.0040	.0046	.0054	.0063	.0073	.0085	.0098	.0114	.0131	.0150	.0173	.0198	.0236
7.6	.0053	.0063	.0073	.0086	.0100	.0116	.0134	.0155	.0179	.0206	.0236	.0271	.0310	.0369
7.8	.0084	.0099	.0116	.0135	.0157	.0182	.0211	.0244	.0281	.0322	.0370	.0423	.0482	.0572
8.0	.0133	.0156	.0182	.0212	.0247	.0286	.0330	.0381	.0438	.0502	.0574	.0654	.0743	.0877
8.2	.0210	.0245	.0286	.0332	.0385	.0445	.0514	.0590	.0676	.0772	.0880	.0998	.1129	.1322
8.4	.0328	.0383	.0445	.0517	.0597	.0688	.0790	.0904	.1031	.1171	.1326	.1495	.1678	.1948
8.6	.0510	.0593	.0688	.0795	.0914	.1048	.1197	.1361	.1541	.1737	.1950	.2178	.2422	.2768
8.8	.0785	.0909	.1048	.1204	.1376	.1566	.1773	.1998	.2241	.2500	.2774	.3062	.3362	.3776
9.0	.1190	.1368	.1565	.1782	.2018	.2273	.2546	.2836	.3140	.3456	.3783	.4116	.4453	.4902
9.2	.1763	.2008	.2273	.2558	.2861	.3180	.3512	.3855	.4204	.4557	.4909	.5258	.5599	.6038
9.4	.2533	.2847	.3180	.3526	.3884	.4249	.4618	.4985	.5348	.5702	.6045	.6373	.6685	.7072
9.6	.3496	.3868	.4249	.4633	.5016	.5394	.5762	.6117	.6456	.6777	.7078	.7358	.7617	.7929
9.8	.4600	.5000	.5394	.5778	.6147	.6499	.6831	.7140	.7428	.7692	.7933	.8153	.8351	.8585
10.0	.5745	.6131	.6498	.6844	.7166	.7463	.7735	.7983	.8207	.8408	.8588	8749.	.8892	.9058