

VALUE(S) ADDED 7-24-85

FACT SHEET REVISED _____

VALUE(S) REMOVED _____

Date: October 10, 1984

Surface Water Quality
Standard Documentation

Chemical: Hydrazine

C.A.S. No.(s): 302-01-2

Basis (Human/Aquatic): Aquatic

Standard by Water Classification:

	<u>ug/l</u>	<u>Notes</u>
Classes AA,AA-s;A;A-s;B;C	*	J
Class D	**	K
Classes SA;SB;SC;I		
Class SD		

Remarks: * - 5 ug/l at less than 50 ppm hardness and 10 ug/l at greater than or equal to 50 ppm hardness.
**- 50 ug/l at less than 50 ppm hardness and 100 ug/l at greater than or equal to 50 ppm hardness.

Summary of Information

1. Slonim, A.R., 1977. Acute toxicity of selected hydrazines to the common guppy. Water Research 11: 889-895.
-96hr LC₅₀, static, 20-25 ppm hardness: 0.61 mg/l.
-96hr LC₅₀, static, 400-500 ppm hardness: 3.85 mg/l
2. Liu, D.H.W. and R.E. Nakatani. 1964. Toxicity of industrial chemicals to fish, pp 209-211. In: Biology research annual report for 1963, H.W. - 80500. Hanford Atomic Products Operation. Richland Wash., D.C. As reported in: Becker, CD and T.O. Thatcher, 1973, Toxicity of power plant chemicals to aquatic life, U.S. Atomic Energy Commission, Wash, D.C.
-rainbow trout 76hr TLM, 13.9-15.6°C: 6.8 mg/l.
3. Henderson, V., J.W. Fisher and R. D'Allessandris. 1981. Toxic and teratogenic effects of hydrazine on fathead minnow. (Pimephales promelas) embryos. Bulletin of Env. Cont. and Tox. 26:807-812.
-teratogenic effects after exposure for 48 hrs of fathead minnow eggs at 0.1 mg/l.
-21°C, pH 7.0-7.5, DO 9.0-9.8, hardness of about 150 mg/l.

4. Hunt et al. 1981. Temperature effects on hydrazine toxicity to bluegills. Bulletin of Environmental Contamination and Toxicology 27: 588-595.
 - 96hr LC₅₀ for bluegill = 0.6 mg/l at 10°C, 1.0 mg/l at 15.5°C and 1.2 mg/l at 21°C.
 - 160-190 mg/l hardness, pH 6.7 -8.0, DO 5.8-11.4 ppm.
5. Fisher, J.W. and C.B. Harrah, and W.O. Berry. 1980. Hydrazine: acute toxicity to bluegills and sublethal effects on dorsal light response and aggression. Transactions of the American Fisheries Society 109:304-309.
 - static, 240-292 ppm hardness, 96hr LC₅₀ = 1.08 mg/l.
 - at 0.1 mg/l hydrazine caused increased aggression and prey attacks.
6. Fisher et al. 1978. Acute and behavioural affects of hydrazine on Lepomis macrochirus. Aerospace Medical Research Lab. Report Number ANRL-TR-78-51, Wright-Patterson Air Force Base, Ohio.
 - conducted 48 hr. behavioural test.
 - DO started at 7.2 ppm and after 48hrs. was about 4.0 ppm at 0.01 mg/l hydrazine and about 4.6 ppm DO at 0.001 mg/l hydrazine.
 - within 30 minutes fish at all concentrations tested, including at 0.001 mg/l, were swimming unbalanced and dorsal side angled to surface; but could not repeat in a second trial.

Standard Derivation

Applying a factor of 0.2 to the chronic affect level of 100 ug/l results in a value of 20 ug/l, but it is known that the egg is less sensitive than the larvae stage and it is also possible that the effect could be found at a lower concentration in softwater: it appears then that the standard should be at least less than 20 ug/l. Sublethal behavioral response was observed at 1 ug/l, but the ecological implications of this effect are unclear. These chronic or sublethal data suggest that the standard for hydrazine should lie somewhere between 1 and 20 ug/l.

Hardness mitigates the acute toxicity of hydrazine. Insufficient data is available to calculate a regression equation to relate acute toxicity to varying levels of hardness but the information is sufficient to calculate two standards for hydrazine; one for soft water and one for harder waters. For soft waters, hardness less than 50ppm, applying a factor of 0.01 to the acute value of 0.61 ug/l results in a value of about 5 ug/l; for harder waters, greater than or equal to 50ppm hardness, applying a factor of 0.01 to the acute value of 1 mg/l results in a value of 10 ug/l. These values should be adopted as the standards for all freshwater classes except D. Applying a factor of 0.1 to the same data results in values of 50 and 100 ug/l for soft and hard waters, respectively. These values should be adopted as the class D standard.