Table 2. Chronic Toxicity of Chloride to Aquatic Animals

Species	Test[a]	Chemical	Hardness (mg/L as $CaCO_3$)	Limits (mg/L)[b]	Chronic Value (mg/L)	Reference
FRESHWATER SPECIES						
Cladoceran, *Daphnia pulex*	LC	Sodium chloride	100	314-441	372.1	Birge et al. 1985
Rainbow trout, *Salmo gairdneri*	ELS	Sodium chloride	46	643-1,324	922.7	Spehar 1987
Fathead minnow, *Pimephales promelas*	ELS	Sodium chloride	100	352-533	433.1	Birge et al. 1985

[a] LC = life-cycle or partial life-cycle; ELS = early life-stage.

[b] Measured concentrations of chloride.

Acute-Chronic Ratio

Species	Hardness (mg/L as $CaCO_3$)	Acute Value (mg/L)	Chronic Value (mg/L)	Ratio
Cladoceran, *Daphnia pulex*	100	1,470	372.1	3.951
Rainbow trout, *Salmo gairdneri*	46	6,743	922.7	7.308
Fathead minnow, *Pimephales promelas*	100	6,570	433.1	15.17

Table 3. Ranked Genus Mean Acute Values with Species Mean Acute-Chronic Ratios

Rank[a]	Genus Mean Acute Value (mg/L)	Species	Species Mean Acute Value (mg/L)[b]	Species Mean Acute-Chronic Ratio[c]
		FRESHWATER SPECIES		
12	11,940	American eel, Anguilla rostrata	11,940	-
11	8,906	Goldfish, Carassius auratus	8,906	-
10	6,743	Rainbow trout, Salmo gairdneri	6,743	7.308
9	6,570	Fathead minnow, Pimephales promelas	6,570	15.17
8	6,222	Mosquito, Culex sp.	6,222	-
7	5,870	Bluegill, Lepomis macrochirus	5,870	-
6	4,900	Midge, Chironomus attenuatus	4,900	-
5	4,039	Caddisfly, Hydroptila angusta	4,039	-
4	3,795	Midge, Cricotopus trifascia	3,795	-
3	2,950	Isopod, Lireus fontinalis	2,950	-
2	2,540	Snail, Physa gyrina	2,540	-

Table 5. Other Data on Effects of Chloride on Aquatic Organisms

Species	Chemical	Hardness (mg/L as $CaCO_3$)	Duration	Effect	Concentration (mg/L)[a]	Reference
			FRESHWATER SPECIES			
Alga, *Chlorella pyrenoidosa*	Sodium chloride	-	24 hr	Inhibited growth	301	Kalinkina 1979; Kalinkina and Strogonov 1980 Kalinkina et al. 1978
Protozoan, *Paramecium tetraurelia*	Sodium chloride	-	5 days	17% reduction in cell division	350[b]	Cronkite et al. 1985
Cladoceran (1st instar), *Daphnia magna*	Potassium chloride	-	16 hr	LC50	179	Anderson 1944
Cladoceran (1st instar), *Daphnia magna*	Calcium chloride	-	16 hr	LC50	853	Anderson 1944
Cladoceran (1st instar), *Daphnia magna*	Sodium chloride	-	16 hr	LC50	3,747	Anderson 1944
Cladoceran, *Daphnia magna*	Potassium chloride	-	64 hr	Incipient inhibition	207	Anderson 1948
Cladoceran, *Daphnia magna*	Calcium chloride	-	64 hr	Incipient inhibition	589	Anderson 1948
Cladoceran, *Daphnia magna*	Magnesium chloride	-	64 hr	Incipient inhibition	555	Anderson 1948
Cladoceran, *Daphnia magna*	Sodium chloride	-	64 hr	Incipient inhibition	2,245	Anderson 1948
Cladoceran, *Daphnia magna*	Potassium chloride	45	21 days	Reproductive impairment	44[c]	Biesinger and Christensen 1972

Table 5. *(continued)*

Species	Chemical	Hardness (mg/L as $CaCO_3$)	Duration	Effect	Concentration (mg/L)[a]	Reference
Mosquitofish, *Gambusia affinis*	Sodium chloride	-	24 hr 96 hr	LC50[d]	11,040 10,710	Wallen et al. 1957
Bluegill, *Lepomis macrochirus*	Sodium chloride	412	24 hr 14 days	LC50 (fed)	8,000 8,000	Reed and Evans 1981
Largemouth bass (juvenile), *Micropterus salmoides*	Sodium chloride	412	24 hr 14 days	LC50 (fed)	8,500 8,500	Reed and Evans 1981

[a] Concentration of chloride, not the chemical.

[b] This value was derived from the published graph.

[c] Concentrations not measured in test solutions.

[d] Turbidity = <25 to 320 mg/L.

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