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Material Tested  
Formaldehyde\*

Study Initiated/Completed  
2/22/82 - 2/26/82

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96-HOUR LC50\*\* TO FATHEAD MINNOWS

Summary: Formaldehyde 37-11 (USP) exhibited moderate acute toxicity to fathead minnows under static, unaerated test conditions during a 96-hour exposure. The 96-hour LC50 was estimated to be greater than 38 ppm (v/v) but less than 48 ppm (v/v) in laboratory supply water.

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Procedure: The test material, in original form and prepared as a stock solution, was introduced into all-glass exposure vessels and diluted with laboratory supply water to yield the desired test concentrations in 10-liter final volumes. An identical vessel, containing only laboratory supply water, was designated as the control.

Ten fathead minnows (*Pimephales promelas*) with a 2.4 cm mean standard length and 0.22 g mean wet weight were randomly assigned to each test vessel. Fish were not fed for 48 hours prior to nor during the exposure. The test solutions were not aerated and temperature was maintained at 22°C. Photoperiod was maintained at 16 hours light:8 hours dark. Mortality counts and observations were made every 24 hours during the 96-hour exposure period. Dead fish were removed as they were discovered.

Dissolved oxygen was measured in the control, low and medium test concentrations at the beginning and at 48-hour intervals during the 96-hour exposure period. The pH was measured at the beginning and end of exposure in

the control, low and medium exposure concentrations. Dissolved oxygen was measured in the high test concentration at the beginning and at 48 and 72 hours after the test began. The pH was measured in the high test concentration at the beginning and end of exposure (72 hours). Total alkalinity, hardness (EDTA) and conductivity were measured at the beginning of the test in the control.

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Results: Percent mortalities for fathead minnows exposed to are presented in Table I. The 96-hour LC50 was estimated to be greater than 38 ppm (v/v) but less than 48 ppm (v/v) in laboratory supply water. Hemorrhaging at the gill area was found on dead or dying fish at test concentrations of 38 ppm (v/v) and greater during the 96-hour exposure period. The chemical and physical parameters measured during the test are reported in Table II.

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\* Other names: Formaldehyde 37-11 (USP)

Purity: 37.1%

Composition: 37.75% Formaldehyde  
11.17% Methanol  
51.08% Water

CAS Registry No.: 50-00-0

\*\* LC50 = The concentration which is lethal to 50% of a test population during the specified time period.

Date Issued: March 23, 1982

TABLE I

RESULTS OF A 96-HOUR ACUTE TOXICITY TEST  
WITH FATHEAD MINNOWS EXPOSED TO

Nominal Test Concentrations (ppm, v/v)	Observed Mortality (%)			
	<u>24 Hr.</u>	<u>48 Hr.</u>	<u>72 Hr.</u>	<u>96 Hr.</u>
60	20	90	100	100
48	0	40	100	100
38	0	0	20	20
31	0	0	0	0
24	0	0	10	10
19	0	0	0	0
15	0	0	0	0
10	0	0	0	0
5	0	0	0	0
Control	0	0	0	0

TABLE II

RESULTS OF PHYSICAL AND CHEMICAL PARAMETERS  
MEASURED DURING A 96-HOUR ACUTE TOXICITY TEST  
WITH FATHEAD MINNOWS EXPOSED TO

Nominal Test Concentrations, v/v	60 ppm (High)	24 ppm (Medium)	5 ppm (Low)	Control
<u>Dissolved Oxygen (ppm)</u>				
0 Hr.	8.5	8.5	8.5	8.5
48 Hr.	7.2	6.5	6.5	7.0
72 Hr.	0.7*	-	-	-
96 Hr.	-	5.0	6.0	6.5
<u>pH</u>				
0 Hr.	7.8	7.8	7.8	7.7
72 Hr.	6.7*	-	-	-
96 Hr.		7.5	7.6	7.6
<u>Total Alkalinity (mg/L as CaCO<sub>3</sub>)</u>				
0 Hr.	-	-	-	109
<u>EDTA Hardness (mg/L as CaCO<sub>3</sub>)</u>				
0 Hr.	-	-	-	139
<u>Conductivity (umhos)</u>				
0 Hr.	-	-	-	188

\* Final D.O and pH were taken at 72 hours because complete mortality had occurred.