UNION CARBIDE

Mr. W. J. Ziemba
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Route 100C
Tarrytown, New York

September 11, 1975

Medical Department

Dr. J. J. Welsh
Dr. K. S. Lane

Dear Mr. Ziemba:

The following is a summary of findings made on August 6, 1975 during investigation of various areas at the Tarrytown site.

LINDE BLDG.

A meeting was held with Messrs. Leighton, Sherman, Ziemba and Miss Flanigen to discuss various problems with asbestos, carbon fibers, polyamines, etc.

The laboratories where asbestos and carbon fibers were in use were inspected and the operations reviewed. A personnel type sampler was worn by the operator during the usual procedures of cutting asbestos samples, weighing up batches, etc. This sample showed less than 1 fiber per ml. greater than 5 microns in length. The operator also wears an ultra filter respirator during these operations which usually take no more than 15 minutes and may be performed three or four times a day.

The same operator performs the operations with the carbon fibers. A sample obtained at this time indicated a level of about 12 fibers per ml. greater than 5 microns in length. Based on prior studies, a suggested limit of 0.5 fibers per ml. has been set for a continuous 8 hour per day exposure. While this level found was high, the total time involved was only about 10 minutes. In addition, the operator wore an ultrafilter respirator. It is suggested, however, that cutting and weigh up operations be done in a hood where air-borne fibers can be better controlled.

A method for determining amines in air is attached for use by Miss Flanigen if she wishes to determine amine in air levels.

Also attached are copies of a table of concentrations of various amines and amino compounds having effects on fish in various waters. This can be given to Dr. Sherman. EDTA acids as a group such as

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PLAINTIFF'S EXHIBIT
UC-4225

Versene, Sequestrene, Komplexon, etc. were tested by Clemens and Sneed in University of Oklahoma tap water on fingerling channel catfish as follows: @ 25°C. they found the 24, 48 and 96 hour TLm to 167, 133 and 129 mg/l respectively. During each period all fish withstood 100 mg/l and all succumbed at 316 mg/l.

Information on other materials in their list is not available in the literature searched. In some cases they will probably have to have studies initiated if a particular material looks promising for waste water treatment.

COMPUTER DATA ROOM -02 level Spine Bldg.

Two 100 type units were in use. Background noise is 64 dBA in the room. When operating with covers open the noise level ranges from 92-96 dBA. With the covers closed the level is 81-83 dBA.

It appears that they operate with the covers open about 50% of the time. If this cannot be corrected then ear protection should be worn by the personnel in the room.

It is not felt that over exposure should occur in this room if the units are properly covered.

Thanking you again for courtesies extended, I remain

Very truly yours,

L. J. LaFrance
Industrial Hygienist

LJL/eg
Enc.

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AMINES

DETERMINATION IN AIR

1 *PURPOSE AND LIMITATIONS* This paper describes a chromatographic procedure for the determination of amines in air. This procedure as written will detect a variety of amines in a butanol medium; however, it will not detect di-n-butylamine or ammonia. Amines may be determined in admixture with other amine or when existing separately. Retention times differ in these two cases. A typical admixture chromatogram is shown in this method.

2 INSTRUMENT PARAMETERS

Instrument	Barber-Colman Gas Chromatograph, Series 5000, or equivalent
Recorder	Barber-Colman (Wheelco), 0-5 mv
Column	confidential, see specification P1B-7-
Detector	hydrogen flame
Polarity	negative
Power	negative
Detector temperature	190°C
Injector temperature	140°C
Column temperature	98°C
Attenuation	30
Carrier gas (nitrogen)	33cc per minute, 5 psig
Hydrogen	20 psig
Air	34 psig
Sample size	10 µl

3 SAMPLING PROCEDURE

a) To a midget impinger add 10 ml of butanol.
b) Using a suitable vacuum source and flowmeter or wet test meter, pull air through the butanol scrubber solution at a rate of one liter per minute for ten minutes.
c) Dilute the scrubber solution to 10 ml with additional butanol.

4 ANALYTICAL PROCEDURE

a) Using a 10-µl syringe, inject ten µl of sample into the chromatograph
b) Measure each peak area and read µg of the amine present in the sample from a previously determined calibration curve.

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6 COMPONENT CONSTANTS

Component	Retention time, min:sec In admixture	Separately
Ethylamine, 70 per cent	3:30	3:50
Isopropylamine	4:10	4:30
Diethylamine	5:25	5:50
n-Propylamine	5:50	6:10
Triethylamine	7:00	7:30
Diisopropylamine	7:00	7:10
n-Butylamine	10:30	11:00
n-Butyronitrile	18:20	19:50

7 CALCULATION

$$\frac{A \times B}{\frac{C \times 24.5}{D}} = \text{amine, ppm by volume}$$

A = micrograms of amine read from the calibration curve
B = volume of scrubber solution, ml
C = volume of air sampled, liters
D = molecular weight of amine

8 TYPICAL CHROMATOGRAM A typical chromatogram is shown on page 2.

9 REFERENCE 2-RSC-94

RESEARCH AND DEVELOPMENT DEPARTMENT
TECHNICAL CENTER
South Charleston, West Virginia

NHK/ldl

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[illegible]

[illegible] goldfish, sunfish and bass [illegible] but that 250 mg/l killed them in 8 to 24 hours. Wallen et al. (2940) studied the effect [illegible] the mosquitofish (*Gambusia* [illegible]) in [illegible] at 19-22° C. They found the 96-hour TL[illegible] at which concentration the turbidity was reduced from 180 mg/l to less than 25 mg/l, owing to the [illegible] tion of the alum.

The threshold concentration of aluminum sulfate for immobilization of *Daphnia* [illegible] in Lake Erie water was found to be 106 mg/l ([illegible]).

AMINES AND AMINO COMPOUNDS

(See also Aniline, Benzene Derivatives, Benzylamine, Diethanolamine, Diethylamine, Dimethylamine, Ethylamine, Hydroxylamine, Methylamine, Resin Amines in Chapter IX, Triethylamine, Trimethylamine and Urea.)

Compounds derived from [illegible] is CH_3NH_2, [illegible] CH_3NH_2 [illegible] survey [illegible] that they can [illegible] tion.

[illegible] Miller, and R[illegible] [illegible] at 15-21° C in [illegible] expressed in terms of a [illegible] range of concentration [illegible] lived for 24 hours and [illegible] amines and related compounds, [illegible] reported to be as follows:

Substance	Critical Range, in mg/l
Diamylamine	[illegible]
Bis-benzylethylenediamine [illegible]	[illegible]
Mo[illegible]	[illegible]
Diisobutylamine	[illegible]
Triisobutylamine	[illegible]
Di[illegible]	[illegible]
Monoisobutylamine	[illegible]
Monoisobutylamine	[illegible]

[illegible]	Critical Range, in mg/l
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	30-60
[illegible]	30-50
[illegible]	30-100
[illegible]	30-70
[illegible]	30-70
[illegible]	[illegible]
[illegible]	40-60
[illegible]	40-70
[illegible]	40-80
[illegible]	50-80
[illegible]	70-100
[illegible]	80-120
[illegible]	100-200
[illegible]	160-200
[illegible]	900-1100
[illegible]	1000-1500
[illegible]	1600-2300
[illegible]	4000-[illegible]
[illegible]	6000-8000
[illegible]	7000-15,000
[illegible]	16,000-30,000

According to Smith et al. (2978) the oral DL_{50} for rats and the 95 percent confidence limits for several [illegible] compounds are as follows:

Compound	LD_{50} in gm/kg of body weight	95 percent confidence limits
[illegible]	0.40	0.29-0.56
[illegible]	0.77	0.61-0.94
[illegible]	0.55	0.48-0.62
[illegible]	0.67	0.62-0.71
2-[illegible]-butylamine	0.39	0.34-0.45

4-AMINO-M-TOLUENE SULFONIC ACID $C_7H_6NH_2SO_3H$

Wallen et al. (2940) studied the effect of this compound on the mosquitofish (*Gambusia affinis*) in highly [illegible] at 22-24° C. They found the 24-, 48-, and [illegible] TL[illegible] concentrations to be 425, 410, and 375 mg/l [illegible] turbidity was reduced from 650 mg/l [illegible] maximum dosage lowered the pH [illegible]

AMINOTRIAZOLE

[illegible] Chapter IX.

AMMATE (AMMONIUM SULFAMATE)

[illegible] Chapter [illegible]

AMMONIA NH_3

[illegible] In the pure form, ammonia is a colorless [illegible] very pungent odor, made synthetically from [illegible] and hydrogen, or obtained during [illegible] coal gas. In surface or ground [illegible] generally results from the decompo[illegible] organic matter, being one of the [illegible] of the complex nitrogen cycle. It may also [illegible] the discharge of industrial wastes from chemical [illegible] plants, from ice plants, or from scouring and [illegible] operations where "ammonia water" is used. Rivers known to be unpolluted have very low ammonia concentrations, generally less than 0.2 mg/l as N (2972).

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