AN ABSTRACT OF THE THESIS OF <u>CHOONG HOON CHO</u> for the degree of <u>MASTER OF SCIENCE</u> in <u>CHEMICAL ENGINEERING</u> presented on June 5, 1979.

A mathematical model which was developed by Hauxwell (3) to predict the absorption rate of a slightly soluble gas entrained by a plunging liquid jet was modified to verify the effect of the use of multiple jets on the mass transfer. To make the analysis less complex, the system was designed as a closed one in which the outlet stream was recycled to the control volume as the feed.

A mass transfer factor, TF, which was defined as the summation of the product of the mass transfer coefficient and interfacial area of all the entrained bubbles, was found to be proportional to the product of jet Reynolds number, N_{Re} , and Weber number, N_{We} . The product of these two dimensionless numbers represented the kinetic energy of the stream entering the control volume. Experiments with multiple nozzles were scheduled such that the amount of input kinetic energy was directly proportional to the number of jet streams. The mass transfer factor, TF, was found to increase directly with the kinetic energy of the entering stream at the high N_{Re} of 16000; however, there was smaller dependency between the mass transfer factor and the kinetic energy at the low N_{Re} of 5000. The arrangement of multiple nozzles was also found to have an effect on the mass transfer factor, TF. The closer the distance between the impact point of jet streams became, the more vigorous interaction between the bubbles entrained by each jet stream was observed. This interaction, which often produced the combination of two individual bubbles and the hindrance of some bubbles rising up to the pool surface by a neighboring bubble cone, was considered to be responsible for a slight increase in the mass transfer factor.

The jet length was also found to have a relation with TF. Shorter jet lengths resulted in a slight increase of transfer factor.

OXYGEN ABSORPTION INTO WATER USING

MULTIPLE PLUNGING JETS

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OXYGEN ABSORPTION INTO WATER USING MULTIPLE PLUNGING JETS

I. INTRODUCTION

Entrainment of gas by a plunging stream of liquid, an event which is commonly observed around us as in the waterfall or in a water stream from a kitchen faucet, may have a beneficial aspect from the point of efficiency in a vapor-liquid contactor.

The energy supplied by the plunging jet stream causes a great turbulence in the liquid pool; this action can aid blending within the pool and thus eliminate the need of other commonly used mechanical agitating devices. Aeration of wastewater tanks by aqueous jets is particularly favorable from that point.

Another important consequence of plunging jets is that the gas bubbles entrained by the jet stream will create a large interfacial area between the gas and liquid. Since mass transfer rates are directly related to the area of contact, the larger interfacial area should result in a more efficient vapor-liquid contactor.

The mass transfer from the bubbles entrained by a single jet plunging into an aqueous pool has been studied by previous investigators. This project was designed to extend the conclusions of the earlier studies by investigating the effect of the use of multiple jets and their arrangements on the mass transfer rate. It is hoped that the information gained relative to the mass transfer rate may lead to direct application of this study to waste water treatment.

II. THEORETICAL CONSIDERATIONS

Hauxwell reported a general relationship between the absorption rate and the jet stream characteristics using a jet flowing from one nozzle. This investigation extended Hauxwell's study to verify the effect of the use of multiple nozzles on the mass transfer. A physical system similar to Hauxwell's was used in this experiment so that comparison could be made with the data obtained in the earlier investigation.

Consider the absorption pool shown in Figure III-3 as a control volume. The oxygen gas above the pool surface is absorbed into the aqueous pool in three different ways; (1) through the free jet surface, (2) through the pool surface, and (3) through the surface of the entrained gas bubbles. In addition to those three absorption mechanisms, the entering jet stream may contain oxygen. The oxygen absorbed will be accumulated in the pool or be carried out of the control volume through the pool discharge line. A mass balance based on the oxygen in the control volume gives,

$$\frac{d(C_L V)}{dt} = r_s + r_B + \sum_{i=1}^n r_{Ji} + \sum_{i=1}^n C_J Q_{Ji} - Q_E C_E$$
(1)

where,

C_L = oxygen concentration in the pool (ml/liter) V = pool volume (liter) t = time (min.)

Q_{Ji} = volumetric flow rate of ith jet stream (liter/min.) C_J = oxygen concentration in the jet stream (ml/liter) r_{Ji} = absorption rate through the ith jet stream surface (ml/min.)

4

r_S = absorption rate through the pool surface (ml/min.) r_B = absorption rate through the bubble surface (ml/min.) Q_E = pool discharge volumetric flow rate (liter/min.) C_E = oxygen concentration in the pool discharge (ml/liter)

When a constant pool volume, V, is maintained the flow rate of the summation of the input jet streams must be equal to the pool discharge flow rate i.e.,

$$Q_{E} = \sum_{i=1}^{n} Q_{Ji}$$

If the pool is assumed perfectly mixed, the concentration of the discharge line will be equal to the pool concentration,

$$C_E = C_L$$

When the absorption process is operated on the basis of a closed system, i.e. pool discharge stream is recycled to supply the jet streams, the jet concentration will be equal to the discharge concentration or to the equivalent pool concentration,

$$C_{L} = C_{J}$$

and

$$C_E = C_L = C_J$$

The use of sparingly soluble oxygen gas, and a short, small diameter jet streams with a relatively high velocity produces relatively short exposure of the free jet stream. Accordingly, the free jet surface absorption rate, r_J , can be assumed negligible. Another assumption can be made such that the flow is distributed evenly to n number of nozzles,

$$\sum_{i=1}^{n} C_{J}Q_{Ji} = C_{J} \sum_{i=1}^{n} Q_{Ji}$$

$$= C_{J} \cdot n \cdot Q_{J}$$

$$= C_{J} \cdot Q_{E}$$

$$= C_{E} \cdot Q_{E}$$

With these assumptions and operation restrictions, equation (1) simplifies to the following equation:

$$V \frac{dC_L}{dt} = r_S + r_B$$
 (2)

Whitman's two film theory was adopted to describe the absorption rate. For surface absorption

$$r_{S} = K_{L_{S}} A_{S} (C^{*} - C_{L})$$
 (3)

where,

KL = overall mass transfer coefficient for surface absorption. A_{S}^{*} = area of the pool surface C^{*} = oxygen concentration of pool in equilibrium

with the vapor phase above the pool

6

For the rate of absorption through the entrained bubble surface inside some jth bubble,

$$\mathbf{r}_{Bj} = \mathbf{k}_{Lj} \mathbf{A}_{j} (\mathbf{C}_{ij} - \mathbf{C}_{Lj})$$
(4)

where,

 k_{Lj} = liquid film mass transfer coefficient for the jth bubble C_{ij} = oxygen concentration at gas-liquid interface C_{Lj} = oxygen concentration at the bulk liquid A_i = surface area of the jth bubble

The concentration at the gas-liquid interface, C_{ij} , is equal to the equilibrium value, C^* , and the bulk liquid concentration, C_{Lj} , is equal to C_L . By summing overall n entrained bubbles using the over-all mass transfer concept, the absorption rate through the bubble surface becomes,

$$\mathbf{r}_{\mathrm{B}} = \sum_{j=1}^{n} \mathbf{K}_{\mathrm{L}j} \mathbf{A}_{j} (\mathbf{C}^{*} - \mathbf{C}_{\mathrm{L}})$$
(5)

To calculate r_B in equation (5) the product of the overall mass transfer coefficient and the surface area of each bubble must be known. Unfortunately these are difficult to define. Accordingly, the concept of transfer factor, TF, was used to represent the product of the mass transfer coefficient and the surface area. This concept was successfully adopted by Jackson⁽⁴⁾ and Hauxwell⁽³⁾. This concept of TF was practical and meaningful to simplify the complex process. Let

$$TF = \sum_{j=1}^{n} K_{Lj}A_{j}$$
$$TFS = K_{L_{S}}A_{S}$$

then

$$r_{B} = TF (C^{*} - C_{L})$$
$$r_{S} = TFS (C^{*} - C_{L})$$

and equation (2) reduces to

$$V \frac{dC_{L}}{dt} = TF (C^{*}-C_{L}) + TFS (C^{*}-C_{L})$$
$$= (TF + TFS) (C^{*}-C_{L})$$
$$= TTF (C^{*}-C_{T})$$
(6)

where,

$$TTF = TF + TFS$$

If equation (6) is divided by $C^* \cdot V$ to get a dimensionless concentration C^+ , equation (6) yields,

$$\frac{dC^{+}}{dt} = \frac{TTF}{V} (1-C^{+})$$

With the assumption that TTF is not a function of C^+ , the solution of the differential equation with the initial condition $C^+ = C_0^+$ at t=0 results in

$$\ln \left(\frac{1 - C_0^+}{1 - C_0^+}\right) = \frac{\text{TTF}}{V} t$$
(7)

Equation (7) shows that the data may be plotted as $\ln (\frac{1 - C_o^+}{1 - C_o^+})$ vs

time t, and a straight line through the origin should results with a slope of $\frac{\text{TTF}}{\text{V}}$.

Evaluation of the surface absorption rate, TFS, can be obtained using the same type of graphical analysis. By submerging the jet nozzle just below the pool surface with the same flow conditions which were selected for the entrainment process, the mass transfer can only occur through the surface. Without the bubble input, TTF is reduced to TFS. This procedure results in the following equation,

$$\ln \left(\frac{1 - C_{o}^{+}}{1 - C^{+}}\right) = \frac{\text{TFS}}{\text{V}} t$$
 (8)

When equation (7) and (8) are applied to the properly designed absorption studies, the transfer factor TF as a function of jet stream characteris-tics can be found.

Hauxwell⁽³⁾ reported that the TF values, resulting from the analysis of his work, had a significant correlation with the product of N_{Re} and N_{We} . The exponent on this dimensionless number product turned out

to be nearly unity which would indicate a linear variation of the transfer factor TF with the supply of jet stream kinetic energy. TFS, also was found to correlate well with N_{Re} . In this work, the same analysis will be made to find a correlation of transfer factor with the supply of multiple jet stream kinetic energy.

III. EXPERIMENTAL EQUIPMENT AND PROCEDURE

1. <u>General Equipment Description</u>

The experimental equipment was designed to test the mathematical model which was developed to explain the absorption from entrained gas bubbles.

A 440 mm ID glass cylinder, with the height of 359 mm, was sandwitched between two 12 mm thick plastic plates. Gaskets and silicon rubber sealing were used to provide proper sealings. A pool depth of 300 mm was selected; this depth was chosen so that all of the bubbles entrained from the scheduled experimental jet flow rates would be retained within the pool. This depth was a little bit higher than those selected in the previous investigations, because experimental runs involving higher flow rates were scheduled to meet the desired experimental conditions. The pool volume for this depth was approximately 45.7 liters. Detailed pool volume as a function of depth is tabulated in Table II-4 of Appendix II.

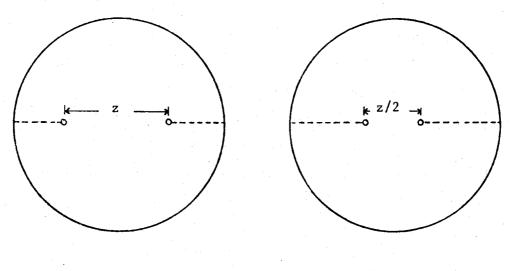
Jet nozzles were placed on the cover plate with tube fittings which were designed so that the nozzles could be easily raised or lowered. The arrangement of the nozzles was determined to test the interaction between the bubbles entrained by the jet streams which were coming out of the neighboring nozzles. The distance between two nozzles and the diagonal distance for four nozzles, was initially 220 mm; this was designated position 0. The distance was then reduced by half, i.e., to 110 mm and this arrangement was designated position A. A third position, designated position B, involved a distance of 55 mm. The last position, designated position C, was set at one eighth of the original distance, or 27.5 mm. The various types of nozzle arrangements are shown on Figure III-1, and Figure III-2. The nozzles were made of copper with a length long enough to insure a fully developed velocity profile. The diameter and L/ID ratio of the nozzle are listed in Table 1.

Table 1. Jet nozzle dimensions

ID (mm)	OD (mm)	L/ID
5.588	6.35	76.23

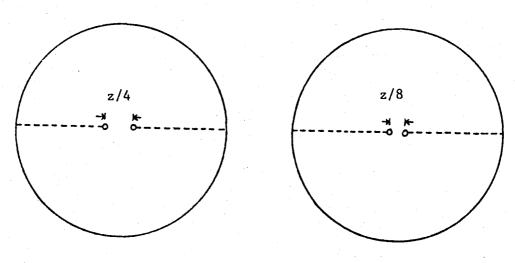
Three 1/8-inch OD stainless steel tubes were located within the cylinder at 154,51 and 102 mm from the center; these tubes provided pool sampling ports. The sample points, designated A, B, and C respectively were located 57, 146, and 216 mm above the bottom of the cylinder. One more tube, designated D, was located in the absorption pool discharge line, right on the bottom of the pool. A schematic drawing of the enclosed system for this experiment is illustrated in Figure III-3.

A small, shell-tube type heat exchanger was inserted between the discharge line from the pool and the pump to remove any heat which might come from the inefficiency of the pump and to maintain an essentially constant pool temperature. A pump was incorporated with a rotameter for



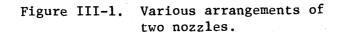
Position 0

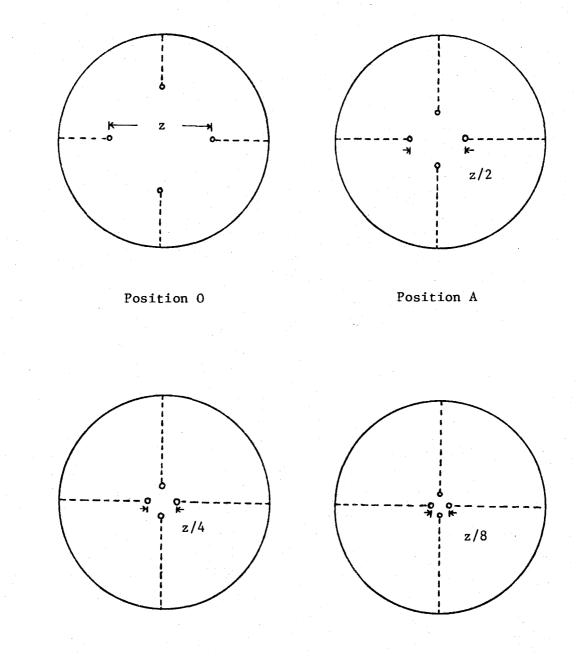
Position A





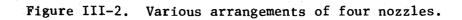
Position C

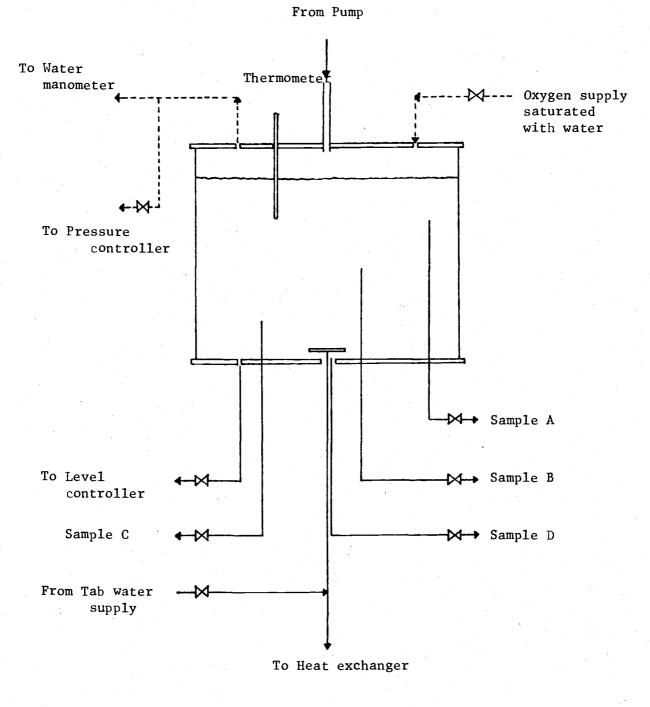












---- Liquid stream ---- Gas stream

Figure III-3. Schematic drawing of the enclosed system.

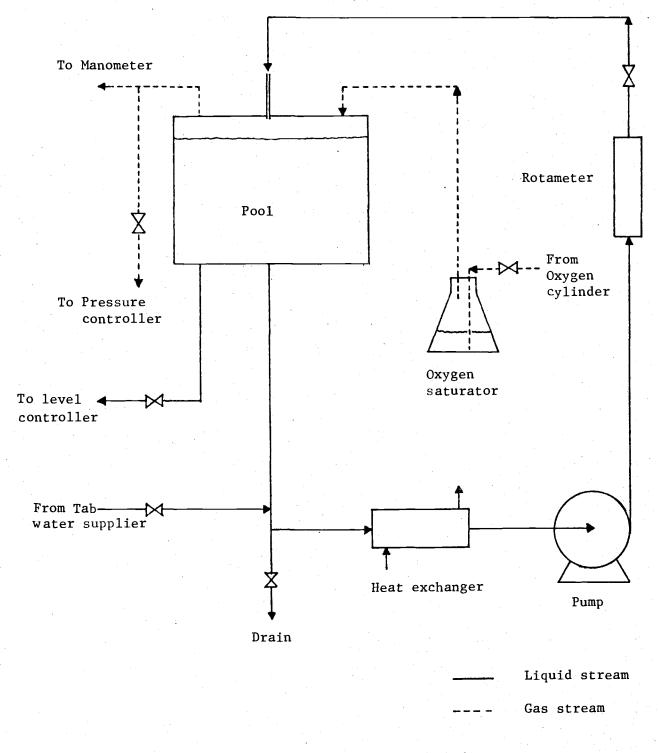
adjusting the flow rate of the stream. Pump specification and the rotameter calibration are tabulated in Table II-1, II-5 of Appendix II, respectively. After passing through the rotameter, the flow was distributed to n number of jet branches. Two and four branches were used for running multiple jets. The distributor was made of brass tube fittings.

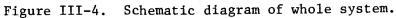
City water was used in this experiment. It was felt that this would provide an aqueous stream and pool closer to what might actually be encountered in many environmental and industrial processes. Pure oxygen gas was fed continuously through a pressure control valve and then bubbled through a water-filled flask, to assure that the supplied oxygen was saturated with water vapor. From this saturator the oxygen was supplied to the cylinder.

A simply-designed, adjustable bubble device was used to control the pressure of the oxygen gas in the cylinder. The vapor pressure was measured by the water manometer. The schematic diagram of the whole system was illustrated in Figure III-4.

A YSI model 54 ARC oxygen meter, which uses an electrolyte-filled probe, was chosen to analyze the samples taken from the absorption pool. The electrode provided a rapid, accurate analysis of sparingly soluble gases such as oxygen.

Another small cylinder was prepared to saturate the distilled water with air under atmospheric pressure. The samples taken from the absorption pool were diluted with this air-saturated distilled water, whose oxygen concentration was measured prior to being used.





2. Procedure

The first step was to measure the oxygen concentration of the airsaturated distilled water which would be used to dilute the samples from the pool or discharge line. It was necessary to have the dilution process to measure the oxygen concentration of sample within the range from 0 to 20 ppm, a range limited by the capacity of the oxygen meter used in this investigation. The distilled water had been saturated with air for over four hours before beginning the experiment. The measurement was repeated two additional times, i.e. during the analysis and after the analysis, to check the consistency of the oxygen concentration.

Following the first step, the cylinder was filled completely with water to sweep all the residual gases out of the cylinder. Then, the proper jet, as well as the flow rate for the desired experimental condition was installed. Jet nozzles were set at 55 mm above the pool surface for the total absorption rate, and were set at 55 mm below the pool surface for the surface absorption rate. The cylinder pool was then drained to the operating level of 300 mm depth, while oxygen gas was fed simultaneously into the cylinder. Excess oxygen gas was supplied throughout the run to keep the oxygen in the cylinder from contamination by atmospheric gases. The pressure of the oxygen gas in the cylinder was maintained at 765 mm Hg, with the excess oxygen gas being bubbled out through the submerged bubble device.

The temperature of the water in the pool was controlled by the heat exchanger to 20 \pm 1°C.

Individual samples were taken simultaneously in 50 ml glass bottles from sampling ports A, B, C, and D. The water in each sampling tube was drained just before taking the samples. The tubes were inserted to the bottom of the sample bottles; these bottles were then filled to the top. These sampled bottles were sealed with solid rubber stoppers to prevent exposure to the atmosphere. Sampling was repeated three additional times at 5 minutes intervals for the total absorption process, and intervals of 30 minutes for the surface absorption process.

The analysis of these samples was taken during the run or right after the run. The 50 ml sample was first transferred to a glass mixing bottle of 290 ml in volume and diluted up to 290 ml with the air-saturated distilled water. A magnetic stirrer was used to mix the solution as perfectly as possible. The oxygen concentration of the mixed solution was measured by inserting the oxygen probe into the mixing bottle; this concentration was recorded in ppm as shown on the scale of the oxygen meter. The probe was polarized and set according to the instructions. The probe was calibrated prior to being used, by following the instruction which was based on the probe temperature and the true local atmospheric pressure. The oxygen probe fitted exactly with the opening of the mixing bottle such that the solution was kept completely separated from the environment. The experimental results were obtained in the form of both time and sample position.

Once the run was over, the water in the cylinder and the lines was completely drained; the cylinder and the lines were then washed out with city water prior to the next run.

IV. ANALYSIS AND DISCUSSION OF RESULTS

The purpose of this study was to find the effect of the number of jets and their arrangements on the gas absorption as a function of time for various jet characteristics. For this investigation the following jet stream conditions, as listed in Table 2, were used.

The experiment was divided into two separate sections. One was for determining only the surface absorption rate and the other was for determining the combination of both surface and entrained bubble absorption rates.

The number of jets	N _{Re}	N _{We}
1	5324	71
1	8908	198
1	13687	466
1	21044	1103
1	24837	1536
1	28819	2068
2	5251	69
2 2 2 2	7640	145
2	12419	384
2	14410	517
2	16401	670
4	5214	68
4	6209	96
4	7205	129
4	8200	167
4	8698	188

Table 2. Experimental jet conditions

The entrained bubble absorption mass transfer rate was determined by subtracting the surface absorption rate from the total absorption rate.

It has been found that mass transfer by entrained bubbles is related to not only the properties of gas and liquid, but also the jet characteristics such as jet length, diameter and velocity. In this investigation, the mass transfer which occurs when using one nozzle was reinvestigated and, as an extended study, the effect of the number of jets and their arrangements on the mass transfer was investigated. Most of the experimental conditions were essentially identical to those used by the previous investigators, except for the jet length and the number of nozzles.

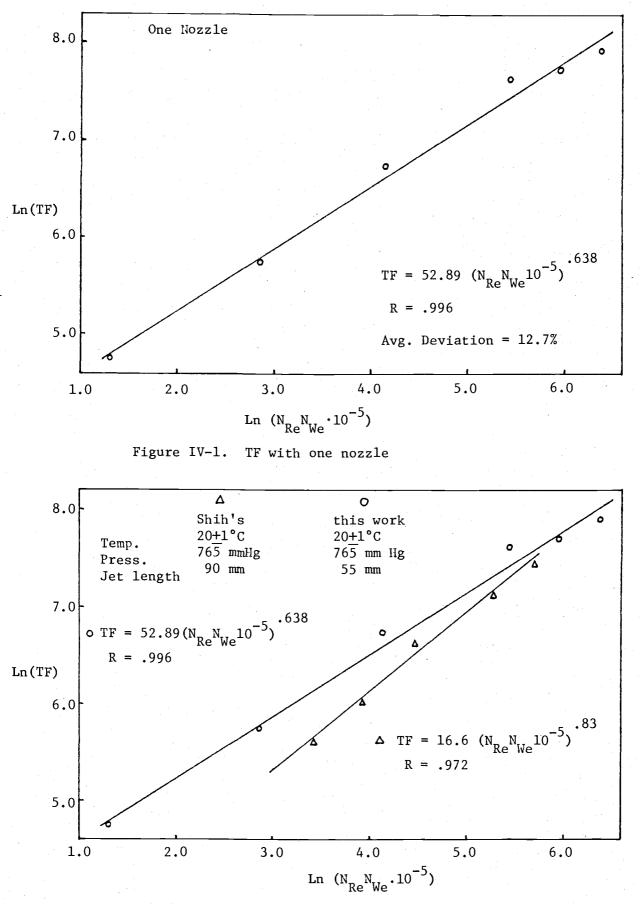
By setting the jet length constant throughout the runs, as well as by fixing the properties of liquid and gas, the emphasis of this investigation involved the effect of the number of jets and their arrangements on the mass transfer rate.

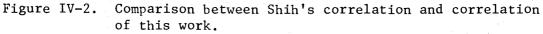
The assumption that the absorption pool was perfectly mixed turned out to be reasonable. The measurement of pool samples at four different positions did not vary significantly. In most cases, the variance among the four samples was less than 2%. An increase in the transfer factor TF was found when the jet length became shorter. This tendency is shown in Figure IV-2 where the results are compared with the previous investigator's⁽⁸⁾. Smith ⁽⁹⁾ reported that the parameters determing the penetration depth were the velocity, the diameter of the jet at the point of impact, and the amount of entrained gas. It was observed that the entrained bubbles became finer as well as the penetration depth of the plunging liquid increased as the shorter jet length was employed. The fine bubbles, which have less buoyancy momentum than bigger ones, tend to stay longer in the liquid; the fine bubbles also have larger interfacial surface area in total than the larger bubbles for same amount of entrained gas. These are two factors which could explain why higher mass transfer rates occurred when the shorter length of jet was used.

Runs with multiple nozzles were scheduled such that input kinetic energy of jet streams was proportional to the number of jet streams. The kinetic energy of the flowing fluid, as represented by the product of Reynolds number N_{Re} , and the Weber number, N_{We} could be established by fixing the diameter and velocity of jets. The results of the experiments with one nozzle, two nozzles, and four nozzles are shown in Figure IV-1, Figure IV-5, and Figure IV-9, respectively. All of these figures confirmed that the transfer factor TF was strongly related to the product of N_{Re} and N_{We} .

As shown in Figure IV-3, the transfer factor increased as the number of nozzles increased. The mass transfer rate with two nozzles was higher than that with one nozzle within the specified range of $N_{Re} \cdot N_{We}$ parameter and apparently tended to be proportional to the number of applied nozzles at the high value of $N_{Re} \cdot N_{We}$. There was a less noticeable tendency at the low value of $N_{Re} \cdot N_{We}$, where the kinetic energy that was put into the pool was much lower.

As far as the runs with four nozzles were concerned, the results turned out less consistent with the results of two nozzles. The slope of the transfer factor with four nozzles was much steeper than expected when compared with the results using one and two nozzles. Due to the





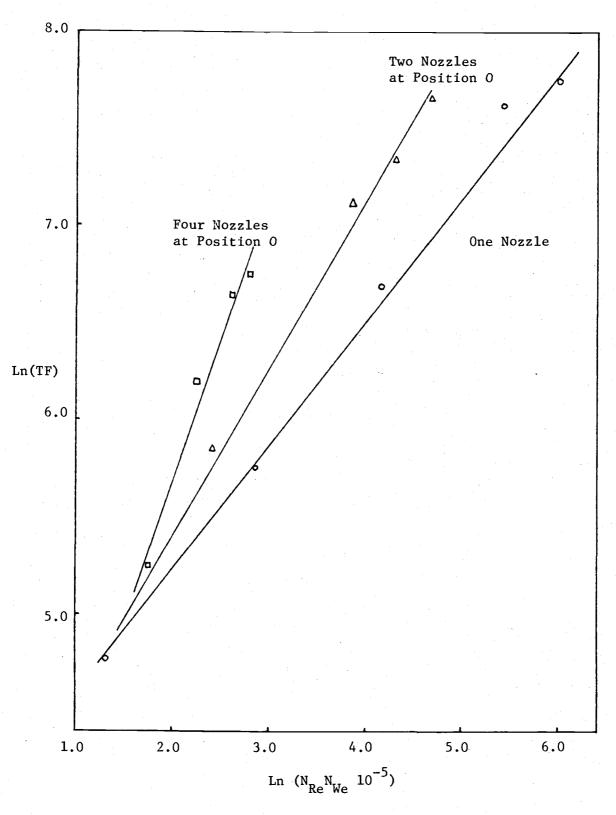


Figure IV-3. Comparison of TF's with different number of nozzles.

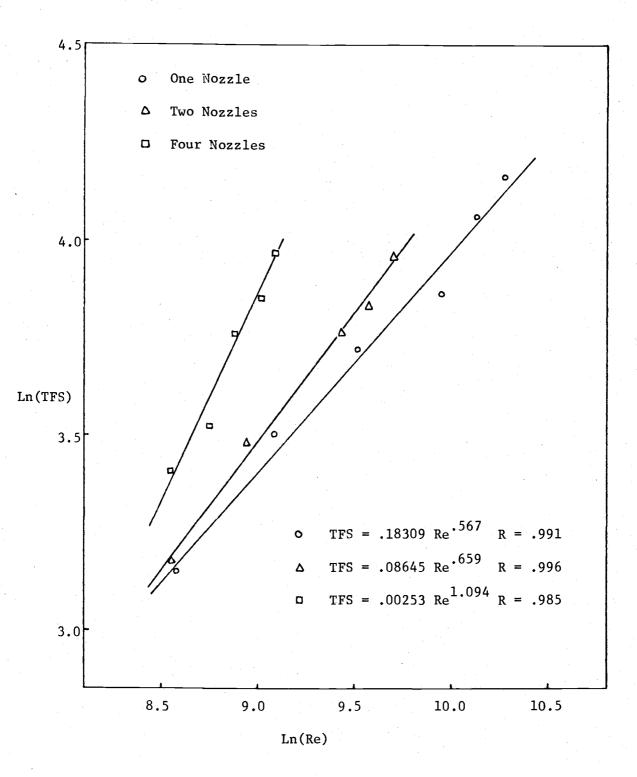


Figure IV-4. Comparison of TFS's with different number of nozzles.

limitation of the quantity of water which could be pumped through the system, the experiments involving the four nozzles were done within a short range of $N_{Re} \cdot N_{We}$; this might be responsible for some inconsistency on the results of four nozzles. Further study with a larger capacity rotameter and a more powerful pump is desirable. However, the data indicated also that higher mass transfer rates occurred as the number of nozzle increased.

It was also found that the surface absorption mass transfer rates increased as the number of nozzles increased. However, Figure IV-4 predicts that the transfer factor for surface absorption,TFS,did not increase as much as the amount of kinetic energy input even at the high Reynolds number, N_{Re} of 16000.

Another investigation was done to verify how the arrangement of the same number of nozzles influenced the mass transfer rates. The results of these experiments, using four different positions with two nozzles, are illustrated from Figure IV-5 to Figure IV-8. At position 0, where the distance between the points of impacts is designated Z, there was no noticeable interactions between the bubbles entrained by the streams flowing from the neighboring nozzle appeared. Apparently, no interactions were observed with position A. However, when the jets were at position B, where the distance between two nozzles was Z/4, the bubbles at the boundary of two bubble cones were observed to mix together and to rise simultaneously to the surface of the pool. When the impact point of the nozzles was at position C, where the distance was Z/8, a larger amount of bubbles were found to intermix. Under this condition, the bubbles

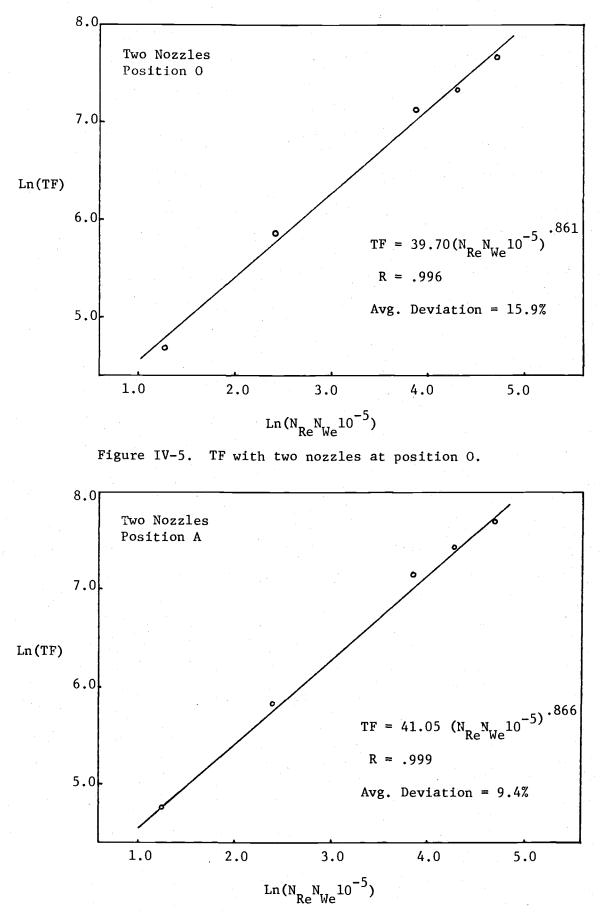


Figure IV-6. TF with two nozzles at position A

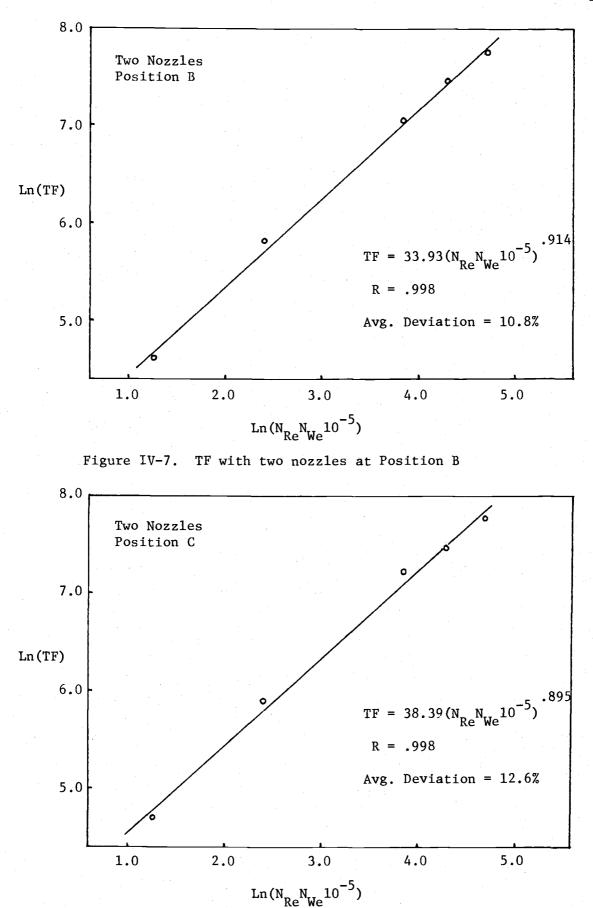
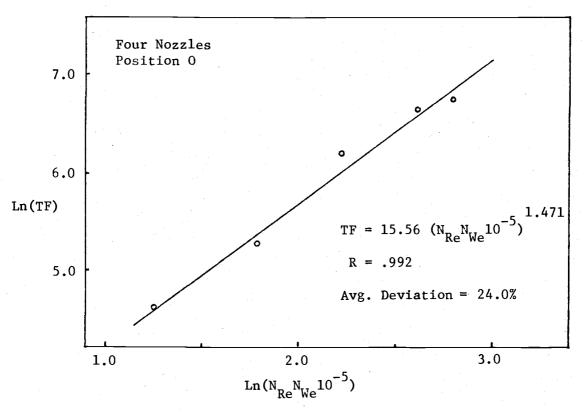
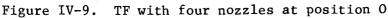


Figure IV-8. TF with two nozzles at position C





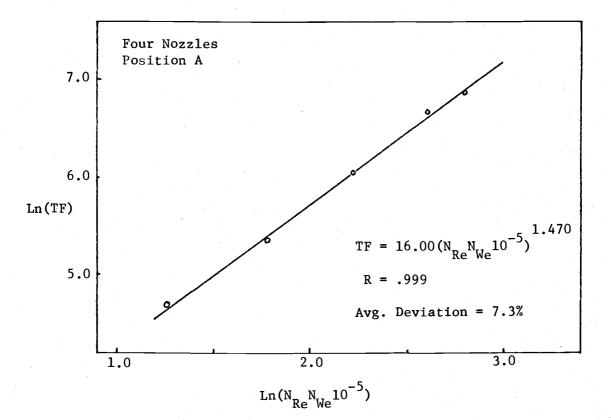
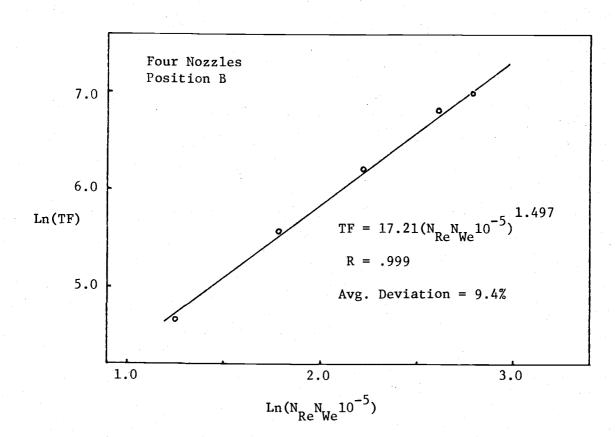
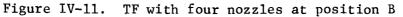


Figure IV-10. TF with four nozzles at position A





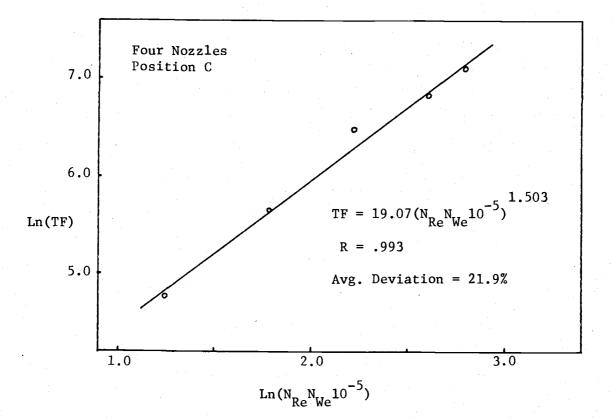


Figure IV-12. TF with four nozzles at position C

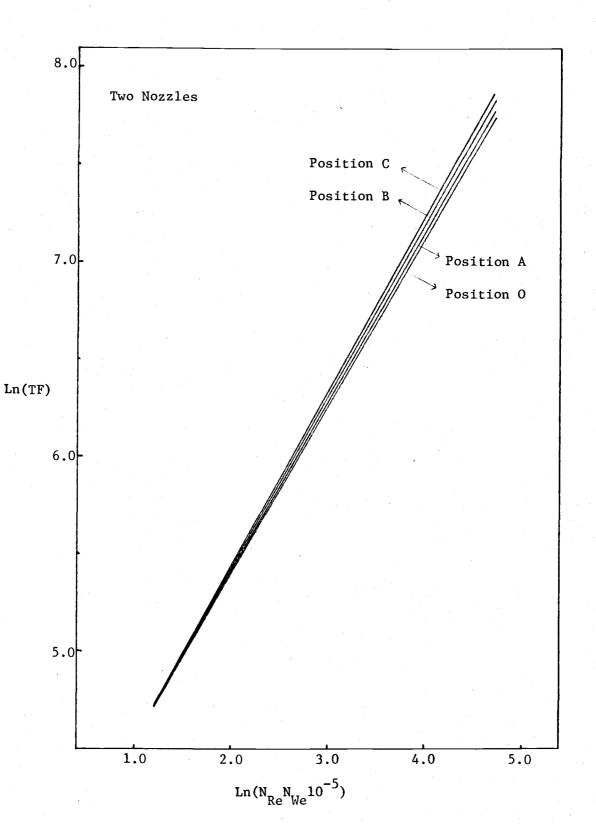


Figure IV-13. Comparison of TF's at different position of two nozzles.

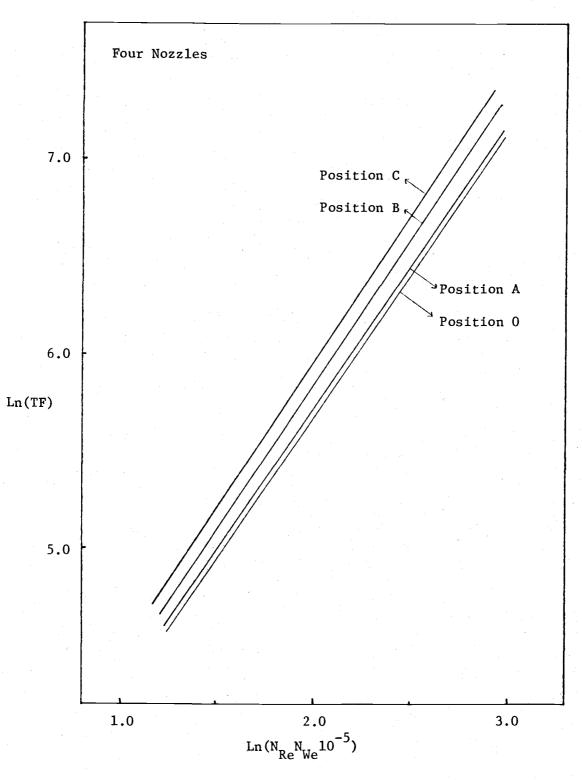


Figure IV-14. Comparison of TF's at different position of four nozzles

entrained by one jet stream seemed to prevent the bubbles entrained by another jet stream from rising to the pool surface; accordingly these bubbles were forced to stay longer in the pool than the bubbles formed with the jets located at position B. The same phenomena were observed in the experiments using four nozzles. The results are shown in Figure IV-9 to IV-12. Unfortunately, when the multiple nozzles were used the turbulence was so vigorous, and the bubbles rose so rapidly that it was impossible to see whether the bubbles at the boundaries of each bubble cone combined with each other to make bigger bubbles. The mass transfer rate, which resulted from the possible interaction between the bubbles, turned out to be slightly higher than the runs without any possible interactions. Figure IV-13 and IV-14 showed that the transfer factor TF increased as the distance between the jet streams became closer.

V. CONCLUSION

The conclusions from the study of entrained oxygen absorption by multiple plunging jet streams are:

- 1. The mass transfer factor TF was found to be proportional to the rate of kinetic energy supplied to the absorption pool by the jet streams which entrained the oxygen bubbles. The product of the jet Reynolds number N_{Re} , and the Weber number, N_{We} , represented the kinetic energy supplied.
- 2. The transfer factor TF was affected by the length of jet. As shorter jet lengths were employed, bubbles became finer and penetrated more deeply down to the bottom of the pool; this resulted in a slight increase in the mass transfer rate.
- 3. An increase in the number of jet streams resulted in an increase of the transfer factor TF. The value of TF tended to increase directly with the number of jet streams; in other words, it increased directly as the amount of input kinetic energy increased. This was especially true at the higher range of Reynolds number, but there was a smaller dependency at the lower range of Reynolds number.
- 4. The surface absorption rate, TFS, was also found to be related to the number of jet streams. Higher TFS values occurred as the number of jet streams increased. However, there was no direct relationship between TFS and the number of jet streams.

5. Higher transfer rates were found to occur when two jets were located closer to each other. When the bubble cones entrained by the jet streams were close enough to contact each other, there was intermixing of the bubbles, which resulted in an increase in the mass transfer factor, TF.

VI. RECOMMENDATIONS FOR FURTHER STUDY

- The variation of the physical properties of liquid such as viscosity, and surface tension may have an effect on the transfer factor TF. Extended study based on these effects is desirable.
- The geometry of jet stream turned out to be related to the mass transfer rate. Quantitative evaluation of the effect of jet length on TF should be studied.
- 3. More detailed study on the interaction between the bubbles, such as combination and hindrance will explain the phenomena precisely when the multiple nozzleswere used.
- Application of this system to the chemical reactor is of great interest. It may be applied to the gas liquid contactor.

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APPENDICES

APPENDIX I

Experimental Code

Coding form of each run was

N - Z - xxxxx - yyyy - C

where,

N = The number of nozzles

Z = Distance between the nozzles

(Diagonal distance for four nozzles)

0 = Distance of z

A = Distance of z/2

B = Distance of z/4

C = Distance of z/8

* Z was skipped for one nozzle

 $xxxxx = N_{Re}$ of one jet stream

 $yyyy = N_{We}$ of one jet stream

C = Run purpose

S = Surface absorption

B = Entrained bubble and surface absorption

APPENDIX II

EQUIPMENT AND MATERIAL SPECIFICATION

Table II-1 Centrifugal pump.

Pump	
Mfgr. Model	Gorman-Rupp Co. 81 1/2 E1 E3/4
Motor	
Mfgr.	General Electric Co.
Mode1	5K 43 GG 3266
Size	3/4 HP

Table II-2 Oxygen meter

Mfgr.	Yellow	Springs	Instrument	Co.
Mode1	54 ARC			

Table II-3 Material Specification

Oxygen	99.999% pure		

Pool depth, h	Pool volume, V
(mm)	(liter)
66	10
79.5	12
105.5	16
132	20
158	24
184.2	28
210.5	32
237	36
263.3	40
289.5	44
310.9	48
$V = (1.52479)(10^{-1}) \cdot h$	
R = .99987	

Table II-4	Pool	Volume	Calibration
------------	------	--------	-------------

By interpolation at h = 300mm, V = 45.7437 liter

Table II-5 Calibration of Rotameter (Fischer & Porter Co. No. B5-27-10/70G)

Meter indication, P	Flow rate, Q
(%)	(liter/min.)
100	10.392
90	9.23
80	8.162
70	7.124
60	5.982
50	4.962
40	3.893
30	2.889
20	1.894
10	0.829
$Q = (1.056025)(10^{-1})$ R = .99983)·P - (2.77714)(10 ⁻¹)

	Temp	erature (⁰ 0	:)
	15.0	20.0	25.0
Density (gm/ml)	.999	.998	.997
Viscosity (centipoise)	1.1404	1.005	.8937
Surface tension (dynes/cm)	73.49	72.75	71.97
ρ / μ (Sec/cm ²)	87.60	99.30	111.56
$\rho / \sigma g_c (Sec^2/cm^3)$.01359	.01372	.01385

Table II-6 Physcial Properties of Water at 1 atm(Ref.: Lange⁽⁵⁾)

Table II-7 Solubility of oxygen in water exposed to water saturated by air (Ref.: Standard Method for the Examination of Water and Wastewater⁽⁷⁾)

Dissolved oxygen (mg/liter)
9.5
9.4
9.2
9.0
8.8

APPENDIX III

EXPERIMENTAL DATA

			POOL CONC	CONTENT OF				
AMPLE OSITION				TIME	(HIN.)			. -
			DATA1	5. DATA2	DATA1	DATA2	DATA1	15. DATA2
A		.20247		.21679	8.81	.22721	8.98	
В	8.68	.21028	8.75	.21940	8.89	.23763	9.01	.25325
				.21289				
D				.21549				
AVERAGE		.20866		.21614		22144		24704
		10771		.00235		.00499		
3.5.		.00301		.00533		• • • • • • 7 7		.00402
TEMPERATU								
		65 MM HG						
DXYGEN CO	INCENTRA	TION OF		: 8.50	8.53	8.58		
AIR SATU	IRATED D	ISTILLED	WATER	AVERAGE	8.537			
ABLE II- 2	MEASUR	EMENTS OF	- OXYGEN	CONTENT OF	DILUTE	D SAMPLES FOR RUN 1	(DATA1,P - 5324-	PH) AND 71-5
II- 2	MEASUR DIMENS	EMENTS OF	F OXYGEN Pool Conc	CONTENT OF ENTRATION(IILUTE Data2)	FOR RUN 1	- 5324-	71-5
II- 2 CAMPLE	MEASUR DIMENS	EMENTS OF Ionless F	F OXYGEN Pool Conc 	CONTENT OF ENTRATION(TIME	DILUTE DATA2) (MIN.)	FOR RUN 1	- 5324-	71-5
II- 2 AMPLE	MEASUR DIMENS DATA1	EMENTS OF IONLESS F 0. DATA2	F OXYGEN Pool Conc Data1	CONTENT OF ENTRATION() TIME 30. DATA2	DILUTE DATA2) (MIN.) DATA1	FOR RUN 1 60. Data2	- 5324- Data1	71-5 90. DATA2
II- 2 AMPLE OSITION	MEASUR DIMENS DATA1	EMENTS OF IONLESS F O. DATA2	F OXYGEN Pool Conc Data1	CONTENT OF ENTRATION(TIME 30. DATA2	DILUTE DATA2) (MIN.) DATA1	FOR RUN 1 60. DATA2 	- 5324- DATA1	71-S 90. DATA2
II- 2 SAMPLE OSITION	MEASUR DIMENS DATA1 8.63	EMENTS OF IONLESS F O. DATA2 .20944	DATA1	CONTENT OF ENTRATION(TIME 30. DATA2 .22415	DILUTE DATA2) (MIN.) DATA1 8.83	FOR RUN 1 00. DATA2 .23620	- 5324- DATA1 8.95	71-S 90. DATA2 .25225
A B	MEASUR DIMENS DATA1 8.63 8.65	EMENTS OF IONLESS F 0. DATA2 .20744 .21211	DATA1 B.74 B.72	CONTENT OF ENTRATION(TIME 30. DATA2 .22415 .22148	IVILUTE DATA2) (MIN.) DATA1 8.83 8.85	FOR RUN 1 DATA2 -23620 .23887	- 5324- DATA1 8.95 9.00	71-S 90. DATA2 .25225 .25895
II- 2 AMPLE OSITION A B C	MEASUR DIMENS DATA1 8.63 8.65 8.70	EMENTS OF IONLESS F 0. DATA2 .20944 .21211 .21860	DATA1 B.74 B.70 B.70	CONTENT OF ENTRATION(TIME 30. DATA2 .22415 .22148 .21880	IVILUTE DATA2) (MIN.) DATA1 8.83 8.85 8.85 8.88	FOR RUN 1 DATA2 .23620 .23887 .24289	- 5324- DATA1 8.95 9.00 8.97	71-S 90. DATA2 .25225 .25895 .25493
II- 2 AMPLE OSITION A B C	MEASUR DIMENS DATA1 8.63 8.65 8.70	EMENTS OF IONLESS F 0. DATA2 .20944 .21211 .21860	DATA1 B.74 B.72 B.70 B.75	CONTENT OF ENTRATION() TIME 30. DATA2 .22415 .22148 .21880 .22549	UILUTE DATA2) (HIN.) DATA1 8.83 8.85 8.88 8.80	FOR RUN 1 DATA2 -23620 .23887 .24289 .23218	- 5324- DATA1 8.95 9.00 8.97 8.91	71-S 90. DATA2 .25225 .25895 .25493 .24690
II- 2 AMPLE OSITION A B C U	MEASUR DIMENS DATA1 8.63 8.65 8.70 8.72	EMENTS OF IONLESS F 0. DATA2 .20944 .21211 .21860	DATA1 B.74 B.72 B.70 B.75	CONTENT OF ENTRATION() TIME 30. DATA2 .22415 .22148 .21880 .22549	UILUTE DATA2) (HIN.) DATA1 8.83 8.85 8.88 8.80	FOR RUN 1 DATA2 -23620 .23887 .24289 .23218	- 5324- DATA1 8.95 9.00 8.97 8.91	71-S 90. DATA2 .25225 .25895 .25493 .24690
AVERAGE	MEASUR DIMENS DATA1 8.63 8.65 8.70 8.72	EMENTS OF IONLESS F DATA2 20944 21211 21880 22148 221546	DATA1 BATA1 8.74 8.70 8.70 8.75	CONTENT OF ENTRATION(TIME 30. DATA2 .22415 .22148 .21880	UILUTE DATA2) (MIN.) DATA1 8.83 8.83 8.85 8.88 8.80	FOR RUN 1 DATA2 -23620 .23887 .24289 .23218	- 5324- DATA1 8.95 9.00 8.97 8.91	71-S 90. DATA2 .25225 .25895 .25493 .24690 .25326
A A B C D AVERAGE S.D.	MEASUR DIMENS DATA1 8.63 8.65 8.70 8.72	EMENTS OF IONLESS F 	DATA1 BATA1 8.74 8.70 8.70 8.75	CONTENT OF ENTRATION(TIME 30. DATA2 .22415 .22148 .21880 .22549 .22248	UILUTE DATA2) (MIN.) DATA1 8.83 8.83 8.85 8.88 8.80	FOR RUN 1 DATA2 -23620 .23887 .24289 .23218 .23754	- 5324- DATA1 8.95 9.00 8.97 8.91	71-S 90. DATA2 .25225 .25895 .25493 .24690 .25326
A A A B C D AVERAGE S.D. ENPERATU	MEASUR DIMENS DATA1 8.63 8.65 8.70 8.72	EMENTS OF IONLESS F 	DATA1 B.74 B.72 B.70 B.75	CONTENT OF ENTRATION(TIME 30. DATA2 .22415 .22148 .21880 .22549 .22248	UILUTE DATA2) (MIN.) DATA1 8.83 8.83 8.85 8.88 8.80	FOR RUN 1 DATA2 -23620 .23887 .24289 .23218 .23754	- 5324- DATA1 8.95 9.00 8.97 8.91	71-S 90. DATA2 .25225 .25895 .25493 .24690 .25326
APLE CSITION AVERAGE S.U. IEMPERATU RESSURE	MEASUR DIMENS DATA1 8.63 8.63 8.70 8.72 IRE : 2 : 7	EMENTS OF IONLESS F 	DATA1 B.74 8.74 8.70 8.75	CONTENT OF ENTRATION() TIME 30. DATA2 .22415 .22148 .21880 .22549 .22248 .00257	UILUTE DATA2) (HIN.) DATA1 8.83 8.85 8.88 8.88 8.80	FOR RUN 1 0.23620 .23887 .24289 .23218 .23754 .00390	- 5324- DATA1 8.95 9.00 8.97 8.91	71-S 90. DATA2 .25225 .25895 .25493 .24690 .25326
AVERAGE S.D. AVERAGE S.D. IEMPERATU RESSURE DYYGEN CO	MEASUR DIMENS DATA1 8.63 8.65 8.70 8.72 IRE : 2 : 7 NCENTRA	EMENTS OF IONLESS F DATA2 .20944 .21211 .21880 .22148 .21546 .00487 1.00°C 65 mm hg TION OF	DATA1 B.74 8.72 8.70 8.75	CONTENT OF ENTRATION(TIME 30. DATA2 .22415 .22148 .21880 .22549 .22248	UILUTE DATA2) (MIN.) DATA1 8.83 8.85 8.88 8.80 8.80	FOR RUN 1 0.23620 .23887 .24289 .23218 .23754 .00390 8.58	- 5324- DATA1 8.95 9.00 8.97 8.91	71-S 90. DATA2 .25225 .25895 .25493 .24690 .25326

SAMPLE					(MIN.)			
POSITION								
	DATAI	0. DATA2	DATA1	5. DATA2	DATA1	DATA2		15. DATA2
A	8.70	.20969	8.96	.24414	9.12	.26534	9.31	.29051
В	8.75	.21632	9.00	.24944	9.20	.27593	9.40	.30243
C -	8.70	.20969	8.85	.22956	9.15	.26931	9.27	.28521
D	8.73				9.15	.26931	9.42	.30508
AVERAGE		.21234		.24149		.26997		.29581
S.D.		.00281		.00732		.00381		.00822
TEMPERATU	RE : 2	0.5510						
RESSURE	: 7	65 MM HG						
				: 8.65 Average				
TABLE	MEASUR	EMENTS OF	DXYGEN	CONTENT OF	DILUTE	D SAMPLES	(DATA1,P	PM) AND
TABLE III- 4	MEASUR DIMENS	EMENTS OF Ionless P	OXYGEN Dol conc	CONTENT OF Centration (DILUTE DATA2)	D SAMPLES For Run 1	(DATA1,P - 8908-	PM) AND 198-5
III- 4 Sample	MEASUR DIMENS	EMENTS OF Ionless P	OXYGEN Dol conc	ENTRATION(DILUTE DATA2) (MIN.)	FOR RUN 1	(DATA1,P - 8908- 	PM) AND 198-5
III- 4 Sample	MEASUR DIMENS	IONLESS P	OOL CONC	ENTRATION(DATA2)	FOR RUN 1	- 8908-	198-S
III- 4 Sample	DIMENS	IONLESS P 0. Data2	DOL CONC	CENTRATION TIME 30. DATA2	DATA2)	FOR RUN 1 	- 8908-	198-S
III- 4 Sample	DIMENS	IONLESS P 	DOL CONC DATA1 8.90	ENTRATION TIME 30. DATA2 .23438	DATA2)	FOR RUN 1 60. Data2 .24096	- 8908- DATA1 9.10	198-S 90. DATA2 .26068
III- 4 Sample OSITION A B	DIMENS	IONLESS P 	DOL CONC DATA1 8.90	ENTRATION TIME 30. DATA2 .23438 .23175	DATA2) (MIN.) DATA1 	FDR RUN 1 60. DATA2 .24096 .24096	- 8908- DATA1 9.10 9.11	198-S 90. DATA2 .26068 .26199
III- 4 SAMPLE OSITION A B C	DIMENS	O. DATA2 .21072 .20546 .21466	DOL CONC DATA1 8.90 8.88 8.89	ENTRATION TIME 30. DATA2 .23438 .23175 .23307	DATA2) (MIN.) DATA1 8.95 8.95 9.02	FDR RUN 1 60. DATA2 .24096 .24096 .25016	- 8908- DATA1 9.10 9.11 9.04	198-S 90. DATA2 .26068 .26199 .25279
III- 4 Sample OSITION A B	DIMENS	O. DATA2 .21072 .20546 .21466	DOL CONC DATA1 8.90 8.88 8.89	ENTRATION TIME 30. DATA2 .23438 .23175 .23307	DATA2) (MIN.) DATA1 	FDR RUN 1 60. DATA2 .24096 .24096 .25016	- 8908- DATA1 9.10 9.11 9.04	198-S 90. DATA2 .26068 .26199 .25279
A A B C D AVERAGE	DIMENS	O. DATA2 .21072 .20546 .21466	DOL CONC DATA1 8.90 8.88 8.89	ENTRATION TIME 30. DATA2 .23438 .23175 .23307 .22124 .23011	DATA2) (MIN.) UATA1 8.95 8.95 9.02 9.00	FDR RUN 1 DATA2 -24096 .24096 .25016 .24753 .24490	- 8908- DATA1 9.10 9.11 9.04	198-S 90. DATA2 .26068 .26199 .25279 .25838
A A B C D D	DIMENS	O. DATA2 .21072 .20546 .21466 .21072	DOL CONC DATA1 8.90 8.88 8.89	ENTRATION TIME 30. DATA2 .23438 .23175 .23307 .22124	DATA2) (MIN.) UATA1 8.95 8.95 9.02 9.00	FDR RUN 1 60. DATA2 .24096 .24096 .25016 .24753	- 8908- DATA1 9.10 9.11 9.04	198-S 90. DATA2 .26068 .26199 .25279 .25838
III- 4 SAMPLE OSITION A B C D AVERAGE S.D. TEMPERATU	DIMENS	O. DATA2 .21072 .20546 .21466 .21072 .21039 .00327 O.20°C	DOL CONC DATA1 8.90 8.88 8.89	ENTRATION TIME 30. DATA2 .23438 .23175 .23307 .22124 .23011	DATA2) (MIN.) UATA1 8.95 8.95 9.02 9.00	FDR RUN 1 DATA2 -24096 .24096 .25016 .24753 .24490	- 8908- DATA1 9.10 9.11 9.04	198-S 90. DATA2 .26068 .26199 .25279 .25838
III- 4 SAMPLE POSITION A B C D AVERAGE	DIMENS DATA1 8.72 8.68 8.75 8.72 9.72	IONLESS P 	DOL CONC DATA1 8.90 8.88 8.89	ENTRATION TIME 30. DATA2 .23438 .23175 .23307 .22124 .23011	DATA2) (MIN.) DATA1 8.95 8.95 9.02 9.00	FDR RUN 1 60. DATA2 .24096 .24096 .25016 .24753 .24490 .00405	- 8908- DATA1 9.10 9.11 9.04 9.08	198-S 90. DATA2 .26068 .26199 .25279

SANPLE	1. 1. ¹				(HIN.)			
OSITION	DATA1	0. Data2	DATA1	5. Data2		DATA2		15. DATA2
A	8.62	.20546		.30779		.34715	10.05	
		.22908	9.40	.30779	9.82	.36289	10.10	.39962
	8.70			.31304				
D	8.71	.21727	9.42	.31041	9.85	.36682	10.10	.39962
AVERAGE				.30976				.40192
S.D.		.00837		.00218		.01170		.00821
ENPERATI								
RESSURE	: 7	65 MM HG						
JXYGEN CL	JNCENIRA	TION OF	UATED	: 8.47 AVERAGE	8.60	8.50		
								PORT AND
ABLE III- 6	MEASUR DINENS	EMENTS OF Ionless P	OXYGEN	CONTENT OF Entration(DILUTE DATA2)	D SAMPLES For Run 1	(DATA1,P -13687-	PM) ANI 466-5
III- 6	MEASUR DIMENS	IONLESS P	OOL CONC	ENTRATION(DATA2) I	FOR RUN 1	(DATA1,P -13687- 	PM) AND 466-5
III- 6 GAMPLE	MEASUR DIMENS	IONLESS P	OOL CONC	ENTRATION(Time	UATA2) (NIN.)	FOR RUN 1	-13687-	466-S
III- 6 GAMPLE	DIMENS	O. DATA2	DOL CONC	ENTRATION(TIME 30. DATA2	DATA2) (NIN.) DATA1	FOR RUN 1 60. Data2	-13687- DATA1	466-S 90. Data2
III- 6 GAMPLE	DIMENS	IONLESS P 	DOL CONC	ENTRATION(TIME 30. DATA2	DATA2) (MIN.) DATA1	FOR RUN 1	-13687-	466-S 90. DATA2
III- 6 GAMPLE Position	DIMENS	IONLESS P 0. DATA2 .22162	DOL CONC	ENTRATION(TIME 30. DATA2 .23366 .24704	DATA2) (MIN.) DATA1 B.97 9.00	FOR RUN 1 DATA2 -25641 .26042	-13687- DATA1 9.21 9.12	466-S 90. DATA2 .28852 .27648
A A B C	DIMENS	0. DATA2 .22162 .22028 .23366	DOL CONC DATA1 8.80 8.90 8.95	ENTRATION(TIME 30. DATA2 .23366 .24704 .25373	DATA2) (NIN.) DATA1 B.97 9.00 9.07	FOR RUN 1 	-13687- BATA1 9.21 9.12 9.10	466-S 90. DATA2 -28852 -27648 -27380
III- 6 SAMPLE Position A B	DIMENS	0. DATA2 .22162 .22028 .23366	DOL CONC DATA1 8.80 8.90 8.95	ENTRATION(TIME 30. DATA2 .23366 .24704	DATA2) (NIN.) DATA1 B.97 9.00 9.07	FOR RUN 1 	-13687- BATA1 9.21 9.12 9.10	466-S 90. DATA2 .28852
AMPLE SAMPLE Sosition A B C D AVERAGE	DIMENS DATA1 8.71 8.70 8.80 8.65	O. DATA2 .22162 .22028 .23366 .21359 .22229	DOL CONC DATA1 8.80 8.90 8.95	ENTRATION(TIME 30. DATA2 23366 24704 25373 24436 .24470	DATA2) (MIN.) DATA1 B.97 9.00 9.07 9.10	FOR RUN 1 DATA2 -25641 .26042 .26979 .27380 .26511	-13687- BATA1 9.21 9.12 9.10	466-S 90. DATA2 .28852 .27648 .27380 .28718 .28150
AMPLE SAMPLE Sosition A B C D	DIMENS DATA1 8.71 8.70 8.80 8.65	0. DATA2 .22162 .22028 .23366 .21359	DOL CONC DATA1 8.80 8.90 8.95	ENTRATION(TIME 30. DATA2 .23366 .24704 .25373 .24436	DATA2) (MIN.) DATA1 B.97 9.00 9.07 9.10	FOR RUN 1 	-13687- BATA1 9.21 9.12 9.10	466-S 90. DATA: .2885; .27648 .27380 .28718
III- 6 SAMPLE POSITION A B C D AVERAGE S.D.	DATA1 B.71 8.70 8.80 8.65	O. DATA2 .22162 .22028 .23366 .21359 .22229 .00724	DOL CONC DATA1 8.80 8.90 8.95	ENTRATION(TIME 30. DATA2 23366 24704 25373 24436 .24470	DATA2) (MIN.) DATA1 B.97 9.00 9.07 9.10	FOR RUN 1 DATA2 -25641 .26042 .26979 .27380 .26511	-13687- BATA1 9.21 9.12 9.10	466-S 90. DATA: .2885: .2764(.2738) .2871(.2815(
III- 6 SAMPLE POSITION A B C D AVERAGE S.D. TEMPERATI PRESSURE	DATA1 DATA1 8.71 8.70 8.80 8.65 URE : 2 : 7	IONLESS P 	DOL CONC DATA1 8.80 8.90 8.95	ENTRATION(TIME 30. DATA2 .23366 .24704 .25373 .24436 .24470 .00723	DATA2) (MIN.) DATA1 B.97 9.00 9.07 9.10	FOR RUN 1 	-13687- BATA1 9.21 9.12 9.10	466-S 90. DATA: .2885: .2764(.2738) .2871(.2815(
III- 6 SAMPLE POSITION A B C D AVERAGE S.D. TEMPERATI PRESSURE OXYGEN C	DIMENS DATA1 8.71 8.70 8.80 8.65 URE : 2 : 7 ONCENTRA	0. DATA2 .22162 .22028 .23366 .21359 .22229 .00724 1.00°C	DOL CONC DATA1 8.80 8.90 8.95 8.88	ENTRATION(TIME 30. DATA2 23366 24704 25373 24436 .24470 .00723 : 8.47	DATA2) (MIN.) DATA1 B.97 9.00 9.07 9.10	FOR RUN 1 	-13687- BATA1 9.21 9.12 9.10	466-S 90. DATA: .2885: .2764(.2738) .2871(.2815(

SAMPLE POSITION				TINE				1
PUSITION		0. Data2	DATA1	DATA2	DATA1	DATA2		DATA2
A		.21725		.38349		.47120		.61126
				.39920				
C	8.76	.21071	10.15	.39266	10.65	.45811	11.80	.60864
<u>I</u> t	8.75	.20940	10.00	.37302	10.70	.46465	11.75	.60210
AVERAGE		.21169		.38709		.47054		.60930
S.D.		.00326		.00988		.01120		.00476
TENPERATU Pressure								
OXYGEN CO	NCENTRA	TION OF		: 8.60				
				AVERAGE	8.840			
					•			
						•		
						•		
TABLE	NEASUR	ENENTS OF	OXYGEN	CONTENT OF		SAMPLES	(DATA1,P	PM) AND
TABLE III- 8	NEASUR DIMENS	EMENTS OF Ionless P	OXYGEN Ool Conc	CONTENT OF ENTRATION(DILUTE Data2)	I SAMPLES For run 1	(DATA1,P -21044-1	PM) AND 103-5
III- 8 Sample	MEASUR DIMENS	EMENTS OF Ionless P	OXYGEN Ool Conc 	ENTRATION	DILUTEI DATA2) (HIN.)	SAMPLES For run 1	(DATA1,P -21044-1	PM) AND 103-5
III- 8 Gample	DIMENS	IONLESS P 	OOL CONC	ENTRATION(DATA2) (HIN.)	D SAMPLES FOR RUN 1	-21044-1	103-S 90.
III- 8 Gample	DIMENS	IONLESS P 	OOL CONC	ENTRATION	DATA2) (HIN.) DATA1	FOR RUN 1	-21044-1	103-S 90. DATA2
III- 8 Gample	DIMENS	IONLESS P DATA2 .21820	DOL CONC Data1 9.15	ENTRATION(TIME 30. DATA2 .26290	DATA2) (NIN.) DATA1 	FOR RUN 1 50. DATA2 .27999	-21044-1 DATA1 9.42	103-S 90. DATA2 .29840
III- 8 Sample Position	DIMENS	IONLESS P DATA2 .21820	DOL CONC Data1 9.15	ENTRATION(TIME 30. DATA2	DATA2) (NIN.) DATA1 	FOR RUN 1 50. DATA2 .27999	-21044-1 DATA1 9.42 9.35	103-S 90. DATA2 .29840 .28919
III- 8 Sanple Position	DIMENS	0. DATA2 .21820 .22740 .22346	DATA1 9.15 9.00 9.08	ENTRATION(TIME 30. DATA2 .26290 .24318 .25370	DATA2) (NIN.) DATA1 9.28 9.30	FOR RUN 1 50. DATA2 .27999 .28262	-21044-1 DATA1 9.42 9.35 9.37	103-5 90. DATA2 .29840 .28919 .29182
III- 8 Sanple Position A B	DIMENS	0. DATA2 .21820 .22740 .22346	DATA1 9.15 9.00 9.08	ENTRATION(TIME 30. DATA2 .26290 .24318 .25370	DATA2) (MIN.) DATA1 9.28 9.30 9.29	50. DATA2 .27999 .28262 .28131	-21044-1 DATA1 9.42 9.35 9.37	103-5 90. DATA2 .29840 .28919 .29182
III- 8 SAMPLE Position A B C	DIMENS	0. DATA2 .21820 .22740 .22346	DATA1 9.15 9.00 9.08	ENTRATION (TIME 30. DATA2 .26290 .24318 .25370 .24975 .25238	DATA2) (MIN.) DATA1 9.28 9.30 9.29	FOR RUN 1 50. DATA2 .27999 .28262 .28131 .26947 .27835	-21044-1 UATA1 9.42 9.35 9.37 9.40	103-5 90. DATA2 .29840 .28919 .29182 .29577 .29380
III- 8 SAMPLE POSITION A B C D	DIMENS	O. DATA2 .21820 .22740 .22346 .24318	DATA1 9.15 9.00 9.08	ENTRATION(TIME 30. DATA2 .26290 .24318 .25370 .24975	DATA2) (MIN.) DATA1 9.28 9.30 9.29	FOR RUN 1 50. DATA2 .27999 .28262 .28131 .26947	-21044-1 UATA1 9.42 9.35 9.37 9.40	103-5 90. DATA2 .29840 .28919 .29182 .29577 .29380
III- 8 SAMPLE POSITION A B C D AVERAGE S.D.	DIMENS	0. DATA2 .21820 .22740 .22346 .24318 .22806 .00932	DATA1 9.15 9.00 9.08	ENTRATION (TIME 30. DATA2 .26290 .24318 .25370 .24975 .25238	DATA2) (MIN.) DATA1 9.28 9.30 9.29	FOR RUN 1 50. DATA2 .27999 .28262 .28131 .26947 .27835	-21044-1 UATA1 9.42 9.35 9.37 9.40	103-5 90. DATA2 .29840 .28919 .29182 .29577 .29380
III- 8 SAMPLE POSITION A B C D AVERAGE	DIMENS	0. DATA2 .21820 .22740 .22346 .24318 .22806 .00932 0.20 C	DATA1 9.15 9.00 9.08	ENTRATION (TIME 30. DATA2 .26290 .24318 .25370 .24975 .25238	DATA2) (MIN.) DATA1 9.28 9.30 9.29	FOR RUN 1 50. DATA2 .27999 .28262 .28131 .26947 .27835	-21044-1 UATA1 9.42 9.35 9.37 9.40	103-S 90. DATA2 .29840 .28919 .29182 .29577
III- 8 SAMPLE POSITION A A B C D AVERAGE S.D. TEMPERATU PRESSURE OXYGEN CO	DIMENS	IDNLESS P 	DATA1 9.15 9.00 9.08 9.05	ENTRATION (TIME 30. DATA2 .26290 .24318 .25370 .24975 .25238	DATA2) I (MIN.) UATA1 9.28 9.30 9.29 9.20 9.20 8.65	FOR RUN 1 50. DATA2 .27999 .28262 .28131 .26947 .27835 .00521 8.67	-21044-1 UATA1 9.42 9.35 9.37 9.40	103-5 90. DATA2 .29840 .28919 .29182 .29577 .29380

.

0. 1 DATA2 9 .22749 5 .22222 2 .23144 5 .22222 .22584 .00388	DATA1 10.66 10.53 10.52 10.40	5. DATA2 .44753 .43040 .42908 .41327	DATA1	DATA2	12 00	DATA2
9 .22749 5 .22222 2 .23144 5 .22222 .22584	10.66 10.53 10.52 10.40	****	11 24	57450	12 00	47400
			11.30	.55821	11.80 11.90	.59774
		.43007		.56183 .02254		.60597 .01265
DISTILLED	WATER	AVERAGE	E 8.777	8.80		
1 DATA2	DATAI	DATA2	DATAT	DATA2	DATAI	DATA2
5 .23437 5 .23437 7 .23699	9.34 9.30 9.27	.27241 .26717 .26323	9.48 9.53 9.45	.29078 .29734 .28685	9.80 9.73 9.60	.33276 .32358 .30652
.23667		.26422		.29242		.31931
	RATION OF DISTILLED UREMENTS OF NSIONLESS F 0. 1 DATA2 5 .23437 5 .23437 7 .23699	RATION OF DISTILLED WATER UREMENTS OF OXYGEN NSIONLESS POOL CONC 1 DATA2 DATA1 5 .23437 9.34 5 .23437 9.30 7 .23699 9.27	RATION OF : 8.77 DISTILLED WATER AVERAGE UREMENTS OF OXYGEN CONTENT OF NSIONLESS POOL CONCENTRATION 0. 30. 1 DATA2 DATA1 DATA2 5 .23437 9.34 .27241 5 .23437 9.30 .26717 7 .23699 9.27 .26323	RATION OF : 8.77 8.76 DISTILLED WATER AVERAGE 8.777 UREMENTS OF OXYGEN CONTENT OF DILUTEI NSIONLESS POOL CONCENTRATION(DATA2) F 0. 30. 1 DATA2 DATA1 0. 30. 6 1 DATA2 DATA1 DATA2 5 .23437 9.34 .27241 9.48 5 .23437 9.30 .26717 9.53 7 .23699 9.27 .26323 9.45	RATION OF : 8.77 8.76 8.80 DISTILLED WATER AVERAGE 8.777 UREMENTS OF OXYGEN CONTENT OF DILUTED SAMPLES NSIONLESS POOL CONCENTRATION (DATA2) FOR RUN 1- TIME (MIN.) 0. 30. 60. 1 DATA2 DATA1 DATA2 DATA1 DATA2 5 .23437 9.34 .27241 9.48 .29078 5 .23437 9.30 .26717 9.53 .29734 7 .23699 9.27 .26323 9.45 .28685	RATION OF : 8.77 8.76 8.80 DISTILLED WATER AVERAGE 8.777 UREMENTS OF OXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PRINSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 1-24837-11 TIME (MIN.) 0. 30. 60. 1 DATA2 DATA1 DATA2 DATA1 5 .23437 9.34 .27241 9.48 .29078 9.80

SAMPLE POSITION			· .	TIME	(MIN.)			
0511104		O. DATA2	DATA1	5. DATA2	DATAI	10. DATA2		DATA2
CB	8.65	.23753 .24414 .23091	10.60 10.70 10.80	.49559 .50882 .52206 .52206	11.55 11.60 11.40	.62131 .62793 .60146	12.10	.65440
AVERAGE S.D.		.23918		.51213		.61337		.66763 .01621
TEMPERATU Pressure Dxygen co Air satu	: 7 Incentra	45 MM HG TION OF	WATER.	: 8.20 Average	8.30 8.283	8.35		
	MEASUR DIMENS	EMENTS OF Ionless P 		CONTENT OF ENTRATION() TIME			(DATA1,P -28819-2	FN) AND 068-5
ANPLE OSITION	DATAI	0. DATA2	DATA1	TIME 30. DATA2	(NIN.) Data1	60. Data2	I'ATA 1	90. Data2
CANPLE Cosition	DATA1 9.70 8.80	0. DATA2 .24414	DATA1 8.90 9.10 8.90	TIME 30. DATA2 .27061 .29708 .27061	(NIN.) DATA1 9.10 9.20 9.17	60. DATA2 .29708 .31031 .30634	DATA1 9.45 9.35 9.45	90. DATA2 .34340 .33016 .34340
ANPLE OSITION A B C	DATA1 8.70 8.80 8.80 8.80	0. DATA2 .24414 .25738 .25738	DATA1 8.90 9.10 8.90	TIME 30. DATA2 .27061 .29708 .27061	(NIN.) DATA1 9.10 9.20 9.17 9.25	60. DATA2 .29708 .31031 .30634	DATA1 9.45 9.35 9.45	90. DATA2 .34340 .33016 .34340

TABLE HEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1, PPN) AND

ANPLE	,			TINE	(HIN.)			
USILIUN		0.		5.		10.		15
			DATA1	UATA2	DATA1		DATA1	DATA2
A				.22712				.24036
В	8.78	.21786	8.80	.22050	8.91	.23506	9.00	.24697
C	8.70	.20727	8.83	.22448	8.90	.23374	8.98	.24433
D	8.65	.20065	8.78	.21786	8.85	.22712	8.95	.24038
AVERAGE		.20992		.22249		.23242		.2430(
S.D.		.00655		.00356		.00310		.00281
ENPERATU	IRE : 2	0.5010						· · ·
RESSURE		65 MN HG						
XYGEN CO				: 8.64	8.62	8.60		
AIR SATU	IRATED D	ISTILLED	WATER	AVERAGE	8.620			
					•	• *		
ABLE II-14	MEASUR DIMENS	ENENTS OF	F OXYGEN Pool Conc	CONTENT OF Entration(DILUTE Data2)	D SAMPLES For Run 2	(BATA1,P 2-0- 5251	PM) ANI - 69-1
II-14 AMPLE	MEASUR DIMENS	EMENTS OI Ionless I	F OXYGEN Pool Conc 	CONTENT OF ENTRATION(TIME	DATA2)	FDR RUN 2	(BATA1,P -0- 5251	PM) ANI - 69-5
II-14 AMPLE	MEASUR DIMENS	EMENTS OF Ionless f 	POOL CONC	ENTRATION(TIME	DATA2) (HIN.)	FDR RUN 2	(BATA1,P -0- 5251	- 69-9
II-14 AMPLE	DIHENS	IONLESS 	POOL CONC Data1	ENTRATION(TIME 30. DATA2	DATA2) (HIN.) DATA1	FDR RUN 2 	DATA1	- 69-9 90. Data2
II-14 AMPLE	DIMENS	IONLESS / 0. DATA2	POOL CONC	ENTRATION(TIME 30.	DATA2) (MIN.) DATA1	FDR RUN 2 60. Data2 	0- 5251	- 69-9 90. Data2
II-14 AMPLE OSITION	DIMENS	0. DATA2 .22712	POOL CONC Data1 8.92	ENTRATION(TIME 30. DATA2	DATA2) (MIN.) DATA1 9.01	FDR RUN 2 60. DATA2 .24830	DATA1 9.10	- 69-9 90. DATA2 .26021
II-14 AMPLE OSITION A B	DIMENS	0. DATA2 .22712 .22183	POOL CONC Data1 8.92	ENTRATION(DATA2) (HIN.) DATA1 9.01 9.00	FDR RUN 2 60. DATA2 .24830 .24697	DATA1 9.10 9.09	- 69-9 90. DATA2 .26021 .25888
II-14 AMPLE OSITION A B C	DIMENS	0. DATA2 .22712 .22183 .22315	POOL CONC Data1 8.92 8.90	ENTRATION(TIME 30. DATA2 .23639 .23374 .24168	DATA2) (HIN.) DATA1 9.01 9.00 9.08	FDR RUN 2 60. DATA2 .24830 .24697 .25756	UATA1 9.10 9.12	- 69-9 90. DATA2 .26021 .25888 .2628
II-14 AMPLE OSITION A B C D	DIMENS	0. DATA2 .22712 .22183 .22315	DATA1 8.92 8.90 8.96 8.95	ENTRATION(TIME 30. DATA2 .23639 .23374 .24168	DATA2) (MIN.) DATA1 9.01 9.00 9.08 9.03	FDR RUN 2 60. DATA2 .24830 .24697 .25756	UATA1 9.10 9.12 9.13	- 69-9 90. DATA2 .26021 .25888 .26285
II-14 AMPLE OSITION A B C D	DIMENS DATA1 8.85 8.81 8.82 8.90	O. DATA2 .22712 .22183 .22315 .23374	POOL CONC DATA1 8.92 8.90 8.96 8.95	ENTRATION(TIME 30. DATA2 .23639 .23374 .24168 .24036	DATA2) (MIN.) DATA1 9.01 9.00 9.08 9.03	FDR RUN 2 60. DATA2 .24830 .24697 .25756 .25094	DATA1 9.10 9.12 9.13	- 69-9 90. DATA2 .26021 .25888 .26285 .26418 .26153
II-14 AMPLE OSITION A B C D AVERAGE S.D.	DIMENS	0. DATA2 .22712 .22183 .22315 .23374 .22646 .00463	POOL CONC DATA1 8.92 8.90 8.96 8.95	ENTRATION(TIME 30. DATA2 23639 23374 24168 24036 23804	DATA2) (MIN.) DATA1 9.01 9.00 9.08 9.03	FDR RUN 2 60. DATA2 .24830 .24697 .25756 .25094 .25094	DATA1 9.10 9.12 9.13	- 69-9 90. DATA2 .2602 .25888 .26283 .26283 .26418
II-14 AMPLE OSITION A B C D AVERAGE S.D. EMPERATU	DIMENS	0. DATA2 .22712 .22183 .22315 .23374 .22646 .00463	POOL CONC DATA1 8.92 8.90 8.96 8.95	ENTRATION(TIME 30. DATA2 23639 23374 24168 24036 23804	DATA2) (MIN.) DATA1 9.01 9.00 9.08 9.03	FDR RUN 2 60. DATA2 .24830 .24697 .25756 .25094 .25094	DATA1 9.10 9.12 9.13	- 69-9 90. DATA2 .26021 .25888 .26285 .26418
II-14 AMPLE OSITION A B C D AVERAGE S.D. EMPERATU RESSURE	DIMENS DATA1 8.85 8.81 8.82 8.90 IRE : 2 : 7	O. DATA2 .22712 .22183 .22315 .23374 .22646 .00463 0.50°C	DATA1 8.92 8.90 8.96 8.95	ENTRATION(TIME 30. DATA2 23639 23374 24168 24036 23804	DATA2) (MIN.) DATA1 9.01 9.00 9.08 9.03	FDR RUN 2 60. DATA2 .24830 .24697 .25756 .25094 .25094 .00408	DATA1 9.10 9.12 9.13	- 69-9 90. DATA2 .26021 .25888 .26285 .26418 .26153

			(HIN.)	TIME				SAMPLE Position
	· ·				·	0.		0011108
I DATA 		DATA2		DATA2		DATA2		
.3080	9.70	.26857	9.40	.24227	9.20			
				.25542			9.00	
				.23833			8.92	
.3080	9.70	.28171	9.50	.25148	9.27	.21598	9.00	D
.3057		.27580		.24687				AVERAGE
.0023		.00546		.00586		.00436		S.U.
								EMPERATU
						65 MN HG		
		8.90	8.90	: 8.87		TION OF	NCENTRA	IXYGEN CO
		·	8.890	AVERAGE		ISTILLED		AIK SAIDI
						· · ·		
PPN) AN	(DATA1,P	SAMPLES	DILUTEI	CONTENT OF	OXYGEN	ENENTS OF	NEASUR	ABLE
.PPN) AN 10- 145-	(DATA1,P -0- 7640	SAMPLES Or Run 2	DILUTEI Data2) f	CONTENT OF Entration(OXYGEN Pool Conc	ENENTS OF	NEASUR DINENS	ABLE II-16
.PPN) AN 10- 145-	(DATA1,P -0- 7640 	SAMPLES Or Run 2	DATA2) F	CONTENT OF ENTRATION(TIME	OXYGEN OOL CONC	ENENTS OI Ionless I	HEASUR DINENS	III-16 SAMPLE
10- 145-	-0- 7640	OR RUN 2	DATA2) F (MIN.)	ENTRATION(900L CONC	IONLESS	NEASUR DINENS	II-16
90.	-0- 7640	50. RUN 2	DATA2) F (MIN.)	ENTRATION('OOL CONC	IDNLESS 	DIMENS	II-16 AMPLE OSITION
90.	-0- 7640	OR RUN 2	DATA2) F (MIN.)	ENTRATION('OOL CONC	IDNLESS 	DIMENS	II-16 AMPLE OSITION
90. DATA	-0- 7640 Data1 	OR RUN 2	DATA2) F (MIN.) DATA1	ENTRATION(TIME 30. DATA2	DATA1	O. DATA2	DIMENS	II-16 AMPLE OSITION
90. DATA 2 .2603	-D- 7640 DATA1 9.32	OR RUN 2	UATA2) F (NIN.) DATA1 	ENTRATION(TIME 30. DATA2 .23114	DATA1	O. DATA2 .20594	DIMENS DATA1 8.91	II-16 CAMPLE COSITION A B
90. DATA 2.2603 2.2563	-D- 7640 DATA1 9.32 9.29	OR RUN 2 00. DATA2 .24839 .24573	DATA2) F (MIN.) DATA1 	ENTRATION(TIME 30. DATA2 .23114 .23778	DATA1 9.10 9.15	0. DATA2 .20594 .21523	DINENS DATA1 B.91 8.98	II-16 AMPLE OSITION A B C
90. DATA 2.2603 2.2603 2.2603	-D- 7640 DATA1 9.32 9.29 9.32	OR RUN 2 00. DATA2 .24839 .24573 .25104	DATA2) F (MIN.) DATA1 9.23 9.21 9.25	ENTRATION(TIME 30. DATA2 .23114	DATA1 9.10 9.15 9.08	0. DATA2 .20594 .21523 .21788	DIMENS DATA1 B.91 8.98 9.00	II-16 AMPLE OSITION A B C
90. DATA 2.2603 2.2603 2.2603	-D- 7640 DATA1 9.32 9.29 9.32 9.32 9.33	OR RUN 2 00. DATA2 .24839 .24573 .25104	UATA2) F (NIN.) UATA1 9.23 9.21 9.25 9.24	ENTRATION(TIME 30. DATA2 .23114 .23778 .22849 .24441	DATA1 9.10 9.15 9.08 9.20	0. DATA2 .20594 .21523 .21788	DIMENS DATA1 B.91 8.98 9.00 8.99	II-16 AMPLE OSITION A B C D
90. DATA 2.2603 2.2563 2.2603 2.2616	-D- 7640 DATA1 9.32 9.29 9.32 9.32 9.33	OR RUN 2 00. DATA2 .24839 .24573 .25104 .24971	UATA2) F (NIN.) UATA1 9.23 9.21 9.25 9.24	ENTRATION(TIME 30. DATA2 .23114 .23778 .22849 .24441	DATA1 9.10 9.15 9.08 9.20	O. DATA2 .20594 .21523 .21788 .21655	DIMENS DATA1 B.91 8.98 9.00 8.99	II-16 AMPLE OSITION A B C D
90. DATA 2.2603 2.2563 2.2603 2.2603 2.2616 .2596	-D- 7640 DATA1 9.32 9.29 9.32 9.32 9.33	OR RUN 2 DATA2 .24839 .24573 .25104 .24971 .24872	UATA2) F (NIN.) UATA1 9.23 9.21 9.25 9.24	ENTRATION(TIME 30. DATA2 .23114 .23778 .22849 .24441 .23545	DATA1 9.10 9.15 9.08 9.20	0. DATA2 .20594 .21523 .21788 .21655 .21390 .00469	DIMENS DATA1 8.91 8.98 9.00 8.99	II-16 AMPLE OSITION A B C D AVERAGE S.D.
90. DATA 2.2603 2.2563 2.2603 2.2603 2.2616 .2596	-D- 7640 DATA1 9.32 9.29 9.32 9.32 9.33	OR RUN 2 DATA2 .24839 .24573 .25104 .24971 .24872	UATA2) F (NIN.) UATA1 9.23 9.21 9.25 9.24	ENTRATION(TIME 30. DATA2 .23114 .23778 .22849 .24441 .23545	DATA1 9.10 9.15 9.08 9.20	O. DATA2 .20594 .21523 .21788 .21655 .21390 .00469 0.601C	DIMENS DATA1 B.91 B.98 9.00 B.99 8.99	A B C D AVERAGE S.D. ENPERATUR
90. DATA 2.2603 2.2563 2.2603 2.2603 2.2616 .2596	-D- 7640 DATA1 9.32 9.29 9.32 9.32 9.33	OR RUN 2 	DATA2) F (MIN.) DATA1 9.23 9.21 9.25 9.24 B.90	ENTRATION(TIME 30. DATA2 .23114 .23778 .22849 .24441 .23545	DATA1 9.10 9.15 9.08 9.20	IDNLESS F 0. DATA2 .20594 .21523 .21788 .21655 .21390 .00469 0.60°C 65 MM HG TION OF	DIMENS DATA1 B.91 B.98 9.00 B.99 8.99 8.99 8.99 8.99	III-16 SAMPLE POSITION A B C D AVERAGE

SAMPLE Position				TINE	(MIN.)	*		
-USIIIUN		0.		5.		10.		15.
		UATA2	DATAI	DATA2	DATAI	DATA2	DATA1	IATA2
A	9.05	21566	9 95	32084	10 50.	40430	11 10	48519
B	9.02	.21172	9.80	.31426 .30769 .32478	10.45	.39972	11.10	.48518
C	8.95	.20251	9.75	.30769	10.39	.39183	11.03	.47598
D	9.03	.21303	9.88	.32478	10.55	.41287	11.05	.47861
		.21073		.31689		.40268		.48124
S.D.		.00495		.00651		.00780		.00405
TEMPERATU								
		65 MM HG						
DXYGEN CO				: 8.95				
				AVERAGE				
ABLE	MEASUR	EMENTS D	F OXYGEN	CONTENT OF	DILUTE	D SAMPLES	(DATA1,F	PN) AND
	DIMENS	IONLESS	POOL CONC	ENTRATION	DATA2)	FOR RUN 2	-0-12419	- 384-9
III-18	DIMENS	IONLESS	POOL CONC	ENTRATION	DATA2)	FOR RUN 2	-0-12419	- 384-5
III-18 SAMPLE	DIMENS	IONLESS	POOL CONC	ENTRATION(DATA2) (MIN.)	FOR RUN 2	-0-12419	- 384-S
III-18 SAMPLE	DIMENS	IONLESS 	PDOL CONC	ENTRATION(DATA2) (HIN.)	FOR RUN 2	-0-12419	- 384-S
III-18 Sample OSITION	DIMENS	10NLESS 0. DATA2	POOL CONC Data1 	ENTRATION(TIME 30. DATA2	DATA2) (MIN.) DATA1	FOR RUN 2 60. Data2	-0-12419 DATA1	90. DATA2
III-18 CAMPLE COSITION	DIMENS	O. DATA2 .22127	PDOL CONC Data1 9.45	ENTRATION(TIME 30. DATA2 .26708	DATA2) (MIN.) DATA1 9.52	FOR RUN 2 00. DATA2 .27625	-0-12419 DATA1 9.72	90. DATA2
III-18 GAMPLE OSITION A B	DIMENS	0. DATA2 .22127 .23174	DATA1 9.45 9.43	ENTRATION(TIME 30. DATA2 .26708 .26447	DATA2) (MIN.) DATA1 9.52 9.48	FOR RUN 2 DATA2 .27625 .27101	-0-12419 DATA1 9.72 9.60	- 384-9 90. DATA2 .30243 .28672
II-18 AMPLE OSITION A B C	DIMENS	0. DATA2 .22127 .23174 .23436	DATA1 9.45 9.43 9.35	ENTRATION(TIME 30. DATA2 .26708 .26447 .25399	DATA2) (MIN.) DATA1 9.52 9.48 9.48 9.48	FOR RUN 2 DATA2 .27625 .27101 .27101	-0-12419 9.72 9.60 9.58	90. DATA2 .30243 .28672 .28410
II-18 AMPLE OSITION A B C	DIMENS	0. DATA2 .22127 .23174 .23436	DATA1 9.45 9.43 9.35	ENTRATION(TIME 30. DATA2 .26708 .26447	DATA2) (MIN.) DATA1 9.52 9.48 9.48 9.48	FOR RUN 2 DATA2 .27625 .27101 .27101	-0-12419 9.72 9.60 9.58	90. DATA2 .30243 .28672 .28410
II-18 CAMPLE OSITION A B C D AVERAGE	DIMENS	O. DATA2 .22127 .23174 .23436 .24090 .23207	DATA1 9.45 9.43 9.35 9.35	ENTRATION(TIME 30. DATA2 .26708 .26447 .25399 .25399 .25988	DATA2) (MIN.) DATA1 9.52 9.48 9.48 9.48 9.54	FOR RUN 2 	-0-12419 9.72 9.60 9.58	 - 384-9 90. DATA2 -30243 -28672 -28410 -29326 -29163
II-18 CAMPLE OSITION A B C D	DIMENS	O. DATA2 .22127 .23174 .23436 .24090	DATA1 9.45 9.43 9.35 9.35	ENTRATION(TIME 30. DATA2 .26708 .26447 .25399 .25399	DATA2) (MIN.) DATA1 9.52 9.48 9.48 9.48 9.54	FOR RUN 2 60. DATA2 .27625 .27101 .27101 .27886	-0-12419 9.72 9.60 9.58	 - 384-9 90. DATA2 -30243 -28672 -28410 -29326 -29163
II-18 AMPLE OSITION A B C D AVERAGE S.D.	DIMENS	O. DATA2 .22127 .23174 .23436 .24090 .23207 .00707	DATA1 9.45 9.43 9.35 9.35	ENTRATION(TIME 30. DATA2 .26708 .26447 .25399 .25399 .25988	DATA2) (MIN.) DATA1 9.52 9.48 9.48 9.48 9.54	FOR RUN 2 	-0-12419 9.72 9.60 9.58	90. DATA2 .30243 .28672 .28410 .29326 .29163
III-18 SAMPLE POSITION A AVERAGE S.D. TEMPERATU PRESSURE	DIMENS	IONLESS 	DATA1 9.45 9.43 9.35 9.35	ENTRATION(TIME 30. DATA2 .26708 .26447 .25399 .25399 .25399 .25988 .00596	DATA2) (MIN.) DATA1 9.52 9.48 9.48 9.54	FOR RUN 2 	-0-12419 9.72 9.60 9.58	- 384-9 90. DATA2 .30243 .28672 .28410
III-18 SAMPLE POSITION A A A B C D A VERAGE S.D. TEMPERATU PRESSURE DXYGEN CO	DIMENS	IONLESS 0. DATA2 -22127 .23174 .23436 .24090 .23207 .00707 0.00°C 65 NM HG TION OF	DATA1 9.45 9.43 9.35 9.35	ENTRATION(TIME 30. DATA2 .26708 .26447 .25399 .25399 .25988	DATA2) (MIN.) DATA1 9.52 9.48 9.48 9.54 9.54	FOR RUN 2 	-0-12419 9.72 9.60 9.58	 - 384-9 90. DATA2 -30243 -28672 -28410 -29326 -29163

SANPLE				TIME	(HIN.)			
OSITION		Δ		5.	•	0		15.
			DATA1	DATA2	DATA1	DATA2	DATA1	DATA2
A		.25706		.38404				.56337
B	9.49	.24921	10.52	.38404	11.25	.47959	11.72	54112
C	9.52	.25314	10.50	.38142	11.39	.49792	11.78	.54897
IJ	9.50	.25052	10.39	.36702	11.12	.46258	11.72	.54112
AVERAGE		.25248		.37913		.48123		.54864
S.D.		.00300		.00707		.01267		.00909
TEMPERATU								
PRESSURE	: 7	65 MM HG		- 				
DXYGEN CO AIR SATU	NCENTRA RATED D	TION OF	WATER	: 9.20 AVERAGE	9.15	9.15		
TABLE 111-20	NEASUR DINENS	EMENTS OF Ionless F	OXYGEN Pool conc	CONTENT OF Entration(DILUTE DATA2)	D SANPLES For Run 2	(IATA1,F 2-0-14410	'PM) AND - 517-5
III-20 	NEASUR DINENS	IONLESS F	POOL CONC	ENTRATION(DATA2) 	FOR RUN 2	2-0-14410	- 51/-8
III-20 Sanfle	NEASUR DINENS	IONLESS F	YOOL CONC	ENTRATION(DATA2) (MIN.)	FOR RUN 2		- 51/-8
III-20 SAMPLE	DINENS	O. DATA2	OOL CONC	ENTRATION(TIME 30. DATA2	DATA2) (NIN.) DATA1	FOR RUN 2 60. Data2	 DATA1	90.
III-20 Sanfle Position	DINENS	O. DATA2 .23561	DATA1	ENTRATION(TIME 30. DATA2 .26957	DATA2) (NIN.) DATA1 9.85	60. DATA2 .29569	BATA1 10.09	90. DATA2
III-20 Sanfle Position	DINENS	O. DATA2 .23561	DATA1	ENTRATION(TIME 30. DATA2 .26957	UATA2) (NIN.) UATA1 	60. DATA2 .29569 .28263	DATA1 10.09 10.05	90. DATA2 .32704 .32181
III-20 SANFLE POSITION A B C	DINENS	0. DATA2 .23561 .24344 .26173	DATA1 9.65 9.62 9.60	ENTRATION(TIME 30. DATA2 .26957 .26565 .26304	DATA2) (MIN.) DATA1 9.85 9.75 9.85	60. DATA2 .29569 .28263 .29569	BATA1 10.09 10.05 9.95	90. DATA2 .32704 .32181 .30875
III-20 SANFLE POSITION A B C	DINENS	0. DATA2 .23561 .24344 .26173	DATA1 9.65 9.62	ENTRATION(TIME 30. DATA2 .26957 .26565 .26304	UATA2) (NIN.) UATA1 	60. DATA2 .29569 .28263 .29569	DATA1 10.09 10.05	90. DATA2 .32704 .32181 .30875
III-20 SAMFLE POSITION A B C D AVERAGE	DINENS	0. DATA2 .23561 .24344 .26173 .25650 .24932	DATA1 9.65 9.62 9.60 9.65	ENTRATION(TIME 30. DATA2 .26957 .26565 .26304 .26957 .26695	DATA2) (MIN.) DATA1 9.85 9.75 9.85	60. DATA2 .29569 .28263 .29569 .28655 .29014	BATA1 10.09 10.05 9.95	90. DATA2 .32704 .32181 .30875 .31528 .31822
III-20 SAMFLE POSITION A B C D	DINENS	O. DATA2 .23561 .24344 .26173 .25650	DATA1 9.65 9.62 9.60 9.65	ENTRATION(TIME 30. DATA2 .26957 .26565 .26304 .26957	DATA2) (MIN.) DATA1 9.85 9.75 9.85	FOR RUN 2 DATA2 .29569 .28263 .29569 .28655	BATA1 10.09 10.05 9.95	90. DATA2 .32704 .32181 .30875 .31528 .31822
III-20 SANFLE POSITION A A B C D AVERAGE S.D. TEMPERATU	DINENS DATA1 9.39 9.45 9.59 9.55 JRE : 1	0. DATA2 .23561 .24344 .26173 .25650 .24932 .01035 9.90°C	DATA1 9.65 9.62 9.60 9.65	ENTRATION(TIME 30. DATA2 .26957 .26565 .26304 .26957 .26695	DATA2) (MIN.) DATA1 9.85 9.75 9.85	60. DATA2 .29569 .28263 .29569 .28655 .29014	BATA1 10.09 10.05 9.95	90. DATA2 .32704 .32181 .30875 .31528 .31822
III-20 SANFLE POSITION A B C D AVERAGE	DINENS DATA1 9.39 9.45 9.59 9.55 JRE : 1 : 7	O. DATA2 .23561 .24344 .26173 .25650 .24932 .01035 9.90°C 65 NM HG	DATA1 9.65 9.62 9.60 9.65	ENTRATION(TIME 30. DATA2 .26957 .26565 .26304 .26957 .26695	UATA2) (MIN.) UATA1 9.85 9.75 9.85 9.78	60. DATA2 .29569 .28263 .29569 .28655 .29014 .00572	BATA1 10.09 10.05 9.95	90. DATA2 .32704 .32181 .30875 .31528

ASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1, PPM) AND

SANPLE Position -				TIME	(HIN.)			
PUSIFIUN		0.		5.		10.	· · · ·	15.
		DATA2	DATA1	DATA2	DATA1			IATA2
A		.22627		.40993		.53194		.63689
				.42699			12.08	.60147
				.40469	11.28	.49652	12.29	.62902
I	9.23			.40600	11.15		12.22	.61983
AVERAGE	•	.22857		.41190		.50570		.62180
S.D.		.00326		.00892		.01966		.01320
TEMPERATU								۰.
PRESSURE		65 MM HG						
DXYGEN CON	NCENTRA	TION OF		: 9.00 Average	9.10	9.07		
TARIF	NEASUR	FNENTS OF	NYGEN	CONTENT OF	NTLUTE	D SAMPLES	(DATA1.P	PM) AND
SANPLE	NEASUR DIMENS		OXYGEN OOL CONC	CONTENT OF ENTRATION() TIME			(DATA1,P -0-16401 	PM) AND - 670-9
SAMPLE	MEASUR DIMENS			TIME	(NIN.)			
SAMPLE		0.			(NIN.) DATA1	60. Data2		90.
SAMPLE	DATA1 9.29	0. DATA2 .23753	DATA1	TIME 30. DATA2	(NIN.) DATA1	60. DATA2 	DATA1	90. DATA2
SAMPLE POSITION A B	DATA1 9.29	0. DATA2	DATA1 9.45 9.47	TIME 30. DATA2 .25870 .26135	(MIN.) Data1 9.65 9.65	60. DATA2 .28517 .28517	DATA1 9.84 9.85	90. DATA2 .31031 .31164
SAMPLE Position A	DATA1 9.29 9.20	0. DATA2 .23753	DATA1 9.45 9.47	TIME 30. DATA2 .25870 .26135 .25208	(MIN.) DATA1 9.65 9.65 9.64	60. DATA2 -28517 .28517 .28385	DATA1 9.84 9.85 9.85	90. DATA2 .31031 .31164 .31164
SAMPLE POSITION A B	DATA1 9.29 9.20	0. DATA2 .23753 .22562 .23223	DATA1 9.45 9.47	TIME 30. DATA2 .25870 .26135	(MIN.) Data1 9.65 9.65	60. DATA2 -28517 .28517 .28385	DATA1 9.84 9.85	90. DATA2 .31031 .31164 .31164
SAMPLE POSITION A B C D AVERAGE	DATA1 9.29 9.20 9.25 9.30	0. DATA2 .23753 .22562 .23223 .23885 .23356	DATA1 9.45 9.47 9.40 9.45	TIME 30. DATA2 .25870 .26135 .25208 .25870 .25870 .25771	(MIN.) DATA1 9.65 9.65 9.64	60. DATA2 -28517 .28517 .28385 .27855 .28318	DATA1 9.84 9.85 9.85	90. DATA2 .31031 .31164 .31164 .30502 .30965
SAMPLE POSITION A B C D	DATA1 9.29 9.20 9.25 9.30	0. DATA2 .23753 .22562 .23223 .23885	DATA1 9.45 9.47 9.40 9.45	TIME 30. DATA2 .25870 .26135 .25208 .25870	(MIN.) DATA1 9.65 9.65 9.64	60. DATA2 .28517 .28517 .28385 .27855	DATA1 9.84 9.85 9.85	90. DATA2 .31031 .31164 .31164 .30502 .30965
SAMPLE POSITION A B C D AVERAGE S.D.	DATA1 9.29 9.20 9.25 9.30	0. DATA2 .23753 .22562 .23223 .23885 .23356 .00521	DATA1 9.45 9.47 9.40 9.45	TIME 30. DATA2 .25870 .26135 .25208 .25870 .25870 .25771	(MIN.) DATA1 9.65 9.65 9.64	60. DATA2 -28517 .28517 .28385 .27855 .28318	DATA1 9.84 9.85 9.85	90. DATA2 .31031 .31164 .31164 .30502 .30965
SAMPLE POSITION A B C D AVERAGE	UATA1 9.29 9.20 9.25 9.30 RE : 2 ; 7	0. DATA2 .23753 .22562 .23223 .23885 .23356 .00521 20.50°C 765 MM HG	DATA1 9.45 9.47 9.40 9.45	TIME 30. DATA2 .25870 .26135 .25208 .25870 .25870 .25771	(MIN.) DATA1 9.65 9.65 9.64 9.60	60. DATA2 .28517 .28517 .28385 .27855 .28318 .00273	DATA1 9.84 9.85 9.85	90. DATA2 .31031 .31164 .31164 .30502

NAMPLE TIME (MIN.) 051TION 0. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 <th></th> <th></th> <th></th> <th>·</th> <th>ENTRATION(</th> <th></th> <th></th> <th></th> <th></th>				·	ENTRATION(
0. 5. 10. 15. DATA1 DATA2	SAMPLE								
DATA1 DATA2 DATA1 DATA2 <th< th=""><th>NOTITON</th><th></th><th>0.</th><th></th><th>5.</th><th>1</th><th>0.</th><th></th><th>15.</th></th<>	NOTITON		0.		5.	1	0.		15.
A 8.70 .20172 8.78 .21228 8.89 .22481 8.96 .23473 B 8.65 .19511 8.81 .21492 8.86 .22284 8.97 .23737 D 8.71 .20304 8.80 .21492 8.85 .22152 8.95 .23473 AVERAGE .19974 .21459 .22483 .23572 S.8. .00303 .00144 .00272 .00109 MEMPERATURE : 20.40 ° C .2765 N.B. .00303 .00144 .00272 .00109 MEMPERATURE : 20.40 ° C .2868 8.62 8.70 .2483 .23572 S.B. .00303 .00144 .00272 .00109 MERESURE : 765 MM HG .28.68 8.62 8.70 AIR SATURATED DISTILLED WATER AVERAGE 8.667 MANDINESS POOL CONCENTRATION OF : 8.68 9.30 .28003 9.48 .30372 SAMPLE TIME (MIN.) .2003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25			DATA2	UATA1	DATA2	DATAL	IATA2	DATAL	IATA2
C 8.65 .19511 8.81 .21624 8.90 .22813 8.97 .23737 D 8.71 .20304 8.80 .21492 8.85 .22152 8.95 .23473 AVERAGE .19974 .21459 .22483 .23572 .00109 S.D. .00303 .00144 .00272 .00109 VERPERATURE : 20.40°C .22483 .23572 .00109 VERESSURE : 765 MH H6 .00272 .00109 DXYGEN CONCENTRATION OF : 8.68 8.62 8.70 AIR SATURATED DISTILLED WATER AVERAGE 8.667 FABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES (DATA1, PPM) AND FOR RUN 2-A- 7640- 145-E SAMPLE TIME (MIN.) POSITION 0. 5. 10. 15. A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .2417 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95	A								
D 8.71 .20304 8.80 .21492 8.85 .22152 8.95 .23473 AVERAGE .19974 .21459 .22483 .23572 .00109 S.D. .00303 .00144 .00272 .00109 PRESSURE : 765 MM HG .200019 .22483 .23572 JYGEN CONCENTRATION OF : 8.68 8.62 8.70 AIR SATURATED DISTILLED WATER AVERAGE 8.667 MARE AVERAGE 8.667 MARE DIMENSIONLESS POOL CONCENTRATION (DATA2) FOR RUN 2-A- 7640- 145-F SAMPLE TINE (MIN.) POSITION 0. 5. 10. 15. OATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 C 8.80 .21422 8.95 .23396 9.20 .26684 9.50 .306432 D 0.21422 8.95 .23955 .27509 .30437 S.D. .00378 .00340 .00546									
AVERAGE .19974 .21459 .22483 .23572 S.D. .00303 .00144 .00272 .00109 VENPERATURE : 20.40°C	C	8.65							
S.B. .00303 .00144 .00272 .00109 'REPERATURE : 20.40'C .00109 .00109 .00109 .00109 'RESSURE : 765 MM HG .00272 .00109 DXYGEN CONCENTRATION OF : 8.68 S.62 S.70 AIR SATURATED DISTILLED WATER AVERAGE 8.667 'ABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1.PPM) AND III-24 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE 'SOUTON' 0. 5. 10. 15. OATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A B.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30362 WERAGE .21356 .23955 .27509 .304337 .303746 AVERAGE .21356 .23955 .27509 .304337 S.D. .0037B .00340 .00546<	D	8.71	.20304	8.80	.21492	8.85	.22152	8.95	.23473
TEMPERATURE : 20.40°C PRESSURE : 765 MM HG DXYGEN CONCENTRATION OF : 8.68 8.62 8.70 AIR SATURATED DISTILLED WATER AVERAGE 8.667 TABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPM) AND TABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPM) AND SAMPLE DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE TIME (MIN.) O. 5. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A 8.83 .21817 9.00 .2001 .24054 .21817 9.00 .24317 9.25 .2003 9.48 .30372 B B .21422 B .21422 B .21422 B .21422 .00378 .00340 .00374 .00340 .00302 .27509 .30437 S.D. .00378 .00340 .00546 .00302 TEMPERATURE : 20.251C PRESSURE : 7	AVERAGE		.19974						
PRESSURE : 765 MM HG DXYGEN CONCENTRATION OF : 8.68 8.62 8.70 AIR SATURATED DISTILLED WATER AVERAGE 8.667 TABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPM) AND TIME MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPM) AND TIME MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPM) AND TIME MEASUREMENTS OF DXYGEN CONTENTATION(DATA2) FOR RUN 2-A- 7640- 145-F SAMPLE TIME (MIN.) O. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30632 J 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30764 AVERAGE .21356 .23955 .27509 .304337 .00340 .0	S.U.		.00303		.00144		.00272		.00109
DXYGEN CONCENTRATION OF : 8.68 8.62 8.70 AIR SATURATED DISTILLED WATER AVERAGE 8.647 TABLE NEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPM) AND III-24 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE TIME (MIN.) O. 5. 10. III-24 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE TIME (MIN.) O. 5. 10. III DATA1 DATA2 DATA1 DATA1 DATA2 DATA1 DATA2 A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 JU 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 JU 8.80 .21422 9.00 .24054 9.30 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>· · ·</td><td></td><td></td><td></td></t<>						· · ·			
AIR SATURATED DISTILLED WATER AVERAGE 8.667 TABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMFLES(DATA1,PPM) AND DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE TIME (MIN.) OSITION OSITION A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 D 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 D 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 AVERAGE .21356 .23955 .27509 .30437 S.D00378 .00340 .00546 .00302 TEMPERATURE : 20.25'C PRESSURE : 765 MM HG DXYGEN CONCENTRATION OF : 8.68 8.62 8.70					- 0 / 0	0 / 1	0 70		
III-24 DIMENSIONLESS POOL CONCENTRATION (DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE TINE (MIN.) POSITION 0. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 D 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 AVERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 TEMPERATURE : 20.25*C .27509 .30437 PRESSURE : 765 NN HG .8.68 8.62 8.70	AIR SATU	IRATED D	ISTILLED	WATER	AVERAGE	8.667	0.70		
III-24 DIMENSIONLESS POOL CONCENTRATION (DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE TINE (MIN.) OSSITION 0. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A B.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 D 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 A VERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 JEMPERATURE : 20.25*C .27509 .30437 CRESSURE : 765 MM HG .8.68 8.62 8.70		• • • • • • • • •					- <u></u>		
III-24 DIMENSIONLESS POOL CONCENTRATION (DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE TINE (MIN.) POSITION 0. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A B.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B B.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C B.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 D B.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 AVERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 TEMPERATURE : 20.25*C PRESSURE : 765 MM HG .003740 .00546 .00302 DYGEN CONCENTRATION OF : 8.68 8.62 8.70 .00302									
III-24 DIMENSIONLESS POOL CONCENTRATION (DATA2) FOR RUN 2-A- 7640- 145-E SAMPLE TINE (MIN.) POSITION 0. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A B.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B B.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C B.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 D B.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 AVERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 TEMPERATURE : 20.25*C PRESSURE : 765 MM HG .003740 .00546 .00302 DYGEN CONCENTRATION OF : 8.68 8.62 8.70 .00302			*						
SAMPLE TIME (MIN.) POSITION 0. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 IV 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30746 AVERAGE .21356 .23955 .27509 .30437 .00302 IV 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30746 AVERAGE .21356 .23955 .27509 .30437 .00302 S.D. .00378 .00340 .00546 .00302 TENPERATURE : 20.251C PRESSURE : 765 MM HG .8.68 8.62 8.70 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
O. 5. 10. 15. DATA1 DATA2 DATA1 DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1 DATA1 DATA2 DATA1 DATA1 DATA1 DATA1 DATA1 DATA1 DATA1 DATA1 DATA2 DATA1	TABLE	MEASUR	EMENTS OF	DXYGEN DDI CONC	CONTENT OF	DILUTEI DATA2) F	SAMPLES	(DATA1,P -A- 7640	PM) AND - 145-9
0. 5. 10. 15. DATA1 DATA2 DATA1	TABLE III-24	NEASUR Dimens	EMENTS OF Ionless P	DXYGEN Ool Conc	CONTENT OF Entration(DILUTEI DATA2) F	I SAMPLES For RUN 2	(DATA1,P -A- 7640	PM) AND - 145-B
A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 IV 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 AVERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 IEMPERATURE : 20.251C .27509 .30437 PRESSURE : 765 MM HG .00340 .00546 .00302	III-24 SAMPLE	NEASUR Dimens	EMENTS OF Ionless P	OXYGEN Ool Conc 	ENTRATION(UATA2) F) SAMPLES Or RUN 2	(DATA1,P -A- 7640 	РМ) AND - 145-в
A 8.83 .21817 9.00 .24054 9.30 .28003 9.48 .30372 B 8.75 .20764 9.02 .24317 9.25 .27344 9.45 .29977 C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 IV 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 AVERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 IEMPERATURE : 20.25'C .2868 8.62 8.70	III-24 SAMPLE	NEASUR DIMENS	IONLESS P	OOL CONC 	ENTRATION(UATA2) F (MIN.)	OR RUN 2	-A- 7640 	- 145-Ы
C 8.80 .21422 8.95 .23396 9.20 .26686 9.50 .30635 D 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 AVERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 FENPERATURE : 20.25'C .265 MM HG .002546 .00302 DXYGEN CONCENTRATION OF : 8.68 8.62 8.70	III-24 SAMPLE	DIMENS	0.	DOL CONC Data1	ENTRATION(Tine 5. Data2	UATA2) F 	OR RUN 2 10. Data2	-A- 7640 	- 145-Ы
IV 8.80 .21422 9.00 .24054 9.30 .28003 9.51 .30766 AVERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 FENPERATURE : 20.25'C .27509 .30437 PRESSURE : 765 MM HG .00340 .00546 .00302 DXYGEN CONCENTRATION OF : 8.68 8.62 8.70	III-24 Sample OSITION	DIMENS	O. DATA2	DOL CONC	ENTRATION(TINE 5. DATA2 .24054	UATA2) F (MIN.) UATA1 9.30	OR RUN 2	-A- 7640 DATA1 9.48	- 145-8 15. DATA2
AVERAGE .21356 .23955 .27509 .30437 S.D. .00378 .00340 .00546 .00302 TEMPERATURE : 20.25°C .00340 .00546 .00302 PRESSURE : 765 MM HG .00200 .00200 .00302 DXYGEN CONCENTRATION OF : 8.68 8.62 8.70	III-24 Sample Position A	DIMENS	0. DATA2 .21817	DOL CONC Data1 9.00	ENTRATION(TINE 5. DATA2 .24054	UATA2) F (MIN.) UATA1 9.30	OR RUN 2	-A- 7640 DATA1 9.48	- 145-8 15. DATA2
S.D00378 .00340 .00546 .00302 TEMPERATURE : 20.25'C PRESSURE : 765 MM HG DXYGEN CONCENTRATION OF : 8.68 8.62 8.70	III-24 Sample Dosition A B	DIMENS DATA1 8.83 8.75	0. DATA2 .21817 .20764	DOL CONC DATA1 9.00 9.02	ENTRATION(TINE 5. DATA2 .24054 .24317	UATA2) F (MIN.) UATA1 9.30 9.25	OR RUN 2 10. Data2 .28003 .27344	-A- 7640 DATA1 9.48 9.45 9.50	- 145-£
TENPERATURE : 20.25'C PRESSURE : 765 MM HG DXYGEN CONCENTRATION OF : 8.68 8.62 8.70	III-24 SAMPLE POSITION A B C	DIMENS	0. UATA2 .21817 .20764 .21422	DATA1 9.00 9.02 8.95	ENTRATION(TINE 5. DATA2 .24054 .24317 .23396	UATA2) F (MIN.) UATA1 9.30 9.25 9.20	OR RUN 2 10. Data2 .28003 .27344 .26686	-A- 7640 DATA1 9.48 9.45 9.50	- 145-8 15. DATA2 .30372 .29977 .30635
PRESSURE : 765 MM HG DXYGEN CONCENTRATION OF : 8.68 8.62 8.70	III-24 SAMPLE SOSITION A B C IV	DIMENS	0. DATA2 .21817 .20764 .21422 .21422	DATA1 9.00 9.02 8.95	ENTRATION(TINE 5. DATA2 .24054 .24317 .23396 .24054	UATA2) F (MIN.) UATA1 9.30 9.25 9.20	OR RUN 2 10. DATA2 .28003 .27344 .26686 .28003 .27509	-A- 7640 DATA1 9.48 9.45 9.50	- 145-8 15. DATA2 .30372 .29977 .30635 .30766 .30437
DXYGEN CONCENTRATION OF : 8.68 8.62 8.70	AVERAGE	DIMENS DATA1 8.83 8.75 8.80 8.80 8.80	0. DATA2 .21817 .20764 .21422 .21422 .21356	DATA1 9.00 9.02 8.95	ENTRATION(TINE 5. DATA2 .24054 .24317 .23396 .24054 .24054 .23955	UATA2) F (MIN.) UATA1 9.30 9.25 9.20	OR RUN 2 10. DATA2 .28003 .27344 .26686 .28003 .27509	-A- 7640 DATA1 9.48 9.45 9.50	- 145-£
	III-24 SAMPLE POSITION A B C IV AVERAGE S.D. TEMPERATU	DIMENS DATA1 8.83 8.75 8.80 8.80 8.80	0. UATA2 .21817 .20764 .21422 .21422 .21356 .00378 20.25 °C	DATA1 9.00 9.02 8.95	ENTRATION(TINE 5. DATA2 .24054 .24317 .23396 .24054 .24054 .23955	UATA2) F (MIN.) UATA1 9.30 9.25 9.20	OR RUN 2 10. DATA2 .28003 .27344 .26686 .28003 .27509	-A- 7640 DATA1 9.48 9.45 9.50	- 145-E
AIR SATURATED DISTILLED WATER AVERAGE 8.667	III-24 SAMPLE POSITION A B C I I AVERAGE S.D. TEMPERATU PRESSURE	DIMENS DATA1 8.83 8.75 8.80 8.80 8.80 JRE : 2 : 7	0. UATA2 .21817 .20764 .21422 .21422 .21356 .00378 20.25°C 65 MM HG	DATA1 9.00 9.02 8.95 9.00	ENTRATION(TINE 5. DATA2 .24054 .24317 .23396 .24054 .24054 .23955 .00340	UATA2) F (MIN.) UATA1 9.30 9.25 9.20 9.30	OR RUN 2 DATA2 .28003 .27344 .26686 .28003 .27509 .00546	-A- 7640 DATA1 9.48 9.45 9.50	- 145-8 15. DATA2 .30372 .29977 .30635 .30766

SANFLE POSITION				TIME	(HIN.)			
0311108		0. DATA2	DATAI	5. DATA2	IATA 1	10. DATA2	IATAI	15. DATA2
A .	0 1 4	.21359	0 00	.29335			10 05	E17/7
В	8.51	.20163	9.30	.29335 .30664 .31993 .30000	10.05	.40633	10.75	.49938
C	8.54	.20562	9.40	.31993	10.00	.39969	10.60	.47944
D	8.70	.22689	9.25	.30000	9.90	.38640	10.80	.50603
AVERAGE		.21193		.30498		.39969		.49938
S.D.		.00965		.00983		.00814		.01243
TEMPERATU								
RESSURE					_			
DXYGEN CO AIR SATU	RATED D	ISTILLED	WATER	: 8.45 AVERAGE	8.450			
								· · · · ·
				1				•
	ИЕАСИВ	ENENTO DE	044653	CONTENT OF	51 HTC		(TIATA) D	
11-26	DIMENS	IONLESS P	DOL CONC	CONTENT OF Entration(DATA2)	FOR RUN 2	-A-14410	- 517-1
II-26 CAMPLE	DIMENS	IONLESS P	DOL CONC		DATA2) 	FOR RUN 2	-A-14410	- 517-H
II-26 AMFLE	DIMENS	IONLESS P	OOL CONC	ENTRATION(Time	DATA2) (MIN.)	FDR RUN 2	-A-14410 	- 517-I
II-26 AMFLE	DIMENS	O. DATA2	DOL CONC	ENTRATION(TIME 5. DATA2	DATA2) (MIN.) DATA1	FDR RUN 2	-A-14410 DATA1	- 517-H
II-26 AMPLE OSITION	DIMENS	IONLESS P 0. DATA2 .21394	DOL CONC	ENTRATION(TIME 5. DATA2 .33150	DATA2) (MIN.) DATA1 10.60	FDR RUN 2 10. DATA2 .46211	-A-14410 DATA1 11.00	- 517-H
A BAMFLE COSITION A B	DIMENS	O. DATA2 .21394 .21394	DOL CONC	ENTRATION(TIME 5. DATA2 .33150 .34456	DATA2) (MIN.) DATA1 10.60 10.80	FDR RUN 2 DATA2 -46211 .48824	-A-14410 DATA1 11.00 11.40	- 517-H
II-26 AMFLE OSITION A B C	DIMENS	0. DATA2 .21394 .22700	DOL CONC	ENTRATION(TIME 5. DATA2 .33150 .34456 .37068	DATA2) (MIN.) DATA1 10.60 10.80 10.57	FDR RUN 2 DATA2 -46211 .48824 .45820	-A-14410 DATA1 11.00 11.40 11.40	- 517-H
II-26 AMFLE OSITION A B C	DIMENS	0. DATA2 .21394 .22700	DOL CONC	ENTRATION(TIME 5. DATA2 .33150 .34456	DATA2) (MIN.) DATA1 10.60 10.80 10.57	FDR RUN 2 DATA2 -46211 .48824 .45820	-A-14410 DATA1 11.00 11.40 11.40	- 517-H
II-26 AMFLE OSITION A B C D AVERAGE	DIMENS	O. DATA2 .21394 .21394 .22700 .21133 .21655	DOL CONC 9.60 9.70 9.90 9.80	ENTRATION(TIME 5. DATA2 	DATA2) (MIN.) DATA1 10.60 10.80 10.57 10.70	FDR RUN 2 	-A-14410 DATA1 11.00 11.40 11.40	- 517-H
II-26 AMPLE OSITION A B C D	DIMENS	0. DATA2 .21394 .22700 .21133	DOL CONC 9.60 9.70 9.90 9.80	ENTRATION(TIME 5. DATA2 .33150 .34456 .37068 .35762	DATA2) (MIN.) DATA1 10.60 10.80 10.57 10.70	FDR RUN 2 10. DATA2 .46211 .48824 .45820 .47518	-A-14410 DATA1 11.00 11.40 11.40 11.41	- 517-1 15. DATA: .51430 .5666 .5666 .5679 .5538
A A B C D AVERAGE S.D. IEMPERATU	DIMENS	0. DATA2 .21394 .22700 .21133 .21655 .00613 9.90°C	DATA1 9.60 9.70 9.90 9.80	ENTRATION(TIME 5. DATA2 	DATA2) (MIN.) DATA1 10.60 10.80 10.57 10.70	FDR RUN 2 	-A-14410 DATA1 11.00 11.40 11.40 11.41	- 517-H
III-26 SAMPLE POSITION A B C D AVERAGE S.D. TEMPERATU PRESSURE	DIMENS DATA1 8.70 8.70 8.80 8.68 RE : 1 : 7	IONLESS P 	DOL CONC 9.60 9.70 9.90 9.80	ENTRATION(TIME 5. DATA2 	DATA2) (MIN.) DATA1 10.60 10.80 10.57 10.70	FDR RUN 2 10. DATA2 .46211 .48824 .45820 .47518 .47093 .01181	-A-14410 DATA1 11.00 11.40 11.40 11.41	- 517-H

		(MIN.)	TINE				SANFLE POSITION
15. DATA1 I	DATA2	1 Data1	5. Data2	DATA1	DATA2	DATAI	.021110M
12.00 .8 11.85 .8 11.80 .8 12.00 .8	.54166 .51548 .54166 .52857	11.20 11.00 11.20 11.10	.39767 .38458 .40421 .37803	10.10 10.00 10.15 9.95	.23404 .21833 .22619 .22750	8.85 8.73 8.79 8.80	A B C D
	.53184 .01085	н 	.39112		.22652 .00558		AVERAGE S.D.
					0 00×r	RE : 2	ENPERATU
) S(DATA1,PPH)	SAMPLES	8.533		WATER 	65 NM HG TION OF ISTILLED 	: 7 NCENTRA RATED D 	AIR SATU
)	SAMPLES Or run 2-	BILUTED DATA2) F	AVERAGE	WATER Oxygen DOL Conc	65 NM HG TION OF ISTILLED 	: 7 NCENTRA RATED D MEASUR DIMENS	XYGEN CO AIR SATU ABLE II-28
) 2-1-5251- 15. Data1 I	SAMPLES OR RUN 2- 0. DATA2	8.533 BILUTED DATA2) F (MIN.) DATA1	AVERAGE	DATA1	65 NM HG TION OF ISTILLED ENENTS OF IONLESS F 	: 7 NCENTRA RATED D MEASUR DIMENS	XYGEN CO AIR SATU ABLE II-28 AMPLE
) 2-1-5251- 15. Data1 I	SAMPLES OR RUN 2- DATA2 21521	8.533 BILUTED DATA2) F (MIN.) 1 DATA1 8.71 8.71	AVERAGE	DATA1	65 NM HG TION OF ISTILLED ENENTS OF IONLESS F 0. DATA2 .19417	: 7 NCENTRA RATED D MEASUR DIMENS DIMENS DATA1 8.55	AIR SATU ABLE II-28 CAMPLE OSITION

SAMPLE				TIME	(MIN.)			
POSITION	·	0.		5. DATA2	•	10.		15.
	DATA1	UATA2	DATA1				· • • • • • • • • • • •	
A	8.75	.21999	8.85	.23310	9.15	.27246	9.45	.31182
B	8.68	.21080	8.90	.23966 .23835 .24229	9.18	.27640	9.35	.29870
C	8.70	.21343	8.89	.23835	9.25	.28558	9.47	-31444
I	8.80	.22654	8.92	.24229	9.19	.27771	Y.45	.31182
AVERAGE		.21769		.23835		.27804		.30919
		.00611		.00334		.00476		.00615
TEMPERATU	IRF : 2	0.1010				x		
PRESSURE	: 7	65 MM HG						
				: 8.50				
AIR SATU	JRATED D	ISTILLED	WATER	AVERAGE	8.547	· · · · · · · · · · · · · · · · · · ·		
		• •						
TADIE	NEACHD		DYYGEN	-	NTLUTE	TI SANPIES	(TIATA1.P	PM) ANTI
TABLE 111-30	MEASUR DINENS	EMENTS OF Ionless P	OXYGEN OOL CONC	CONTENT OF	DILUTE DATA2)	D SAMPLES For Run 2	(DATA1,P -B-12419	PM) AND - 384-b
TABLE 111-30	DINENS	IONLESS P	OOL CONC	ENTRATION(DATA2)	FOR RUN 2	-B-12419	- 384-H
III-30 	DINENS	IONLESS P	OOL CONC	ENTRATION(DATA2)	FOR RUN 2	-B-12419	- 384-B
111-30 Sample	DINENS	IONLESS P	OOL CONC	ENTRATION(Time	DATA2) (MIN.)	FOR RUN 2	-B-12419	- 384-B
111-30 Sanple Position	DIMENS	IONLESS P 	OOL CONC	ENTRATION(TIME 5.	DATA2) (MIN.)	FOR RUN 2	-B-12419	- 384-B 15.
III-30 Sanple Position	DIMENS	IONLESS P 	DOL CONC	ENTRATION(Time	DATA2) (MIN.) DATA1	FOR RUN 2	-B-12419 DATA1	- 384-8 15. Data2
III-30 SANPLE Position A	DIMENS DATA1 8.63	0. DATA2 .21376	DOL CONC Data1 9.15	ENTRATION(TIME 5. DATA2 .28212	DATA2) (MIN.) DATA1 10.00	FOR RUN 2 10. BATA2 .39387	-B-12419 DATA1 10.75	- 384-B 15. DATA2
III-30 SANPLE POSITION A B	DIMENS DATA1 8.63 8.57	0. DATA2 .21376 20587	DOL CONC DATA1 9.15 9.35	ENTRATION(TIME 5. DATA2 .28212 .30842	DATA2) (MIN.) DATA1 10.00 10.15	FOR RUN 2 10. DATA2 .39387 .41359	-B-12419 DATA1 10.75 10.65	- 384-B DATA2 .49248 .47933
111-30 SANPLE POSITION A B	DIMENS DATA1 8.63 8.57	0. DATA2 .21376 .20587	DOL CONC DATA1 9.15 9.35	ENTRATION(TIME 5. DATA2 .28212 .30842 .7471	DATA2) (MIN.) DATA1 10.00 10.15	FOR RUN 2	-B-12419 DATA1 10.75 10.65	- 384-B DATA2 .49248 .47933 A8328
111-30 SANPLE POSITION A B	DIMENS DATA1 8.63 8.57	0. DATA2 .21376 .20587	DOL CONC DATA1 9.15 9.35	ENTRATION(TIME 5. DATA2 .28212	DATA2) (MIN.) DATA1 10.00 10.15	FOR RUN 2	-B-12419 DATA1 10.75 10.65	- 384-E
III-30 SANPLE POSITION A B C D	DIMENS DATA1 8.63 8.57 8.61 8.69	0. DATA2 .21376 .20587 .21113 .22164	DATA1 9.15 9.35 9.55 9.45	ENTRATION(TIME 5. DATA2 .28212 .30842 .7471	DATA2) (MIN.) DATA1 10.00 10.15 9.95 10.15	FOR RUN 2	-B-12419 DATA1 10.75 10.65 10.68 10.80	- 384-B 15. DATA2 .49248 .47933 .48328 .49905
III-30 SANPLE POSITION A B C D	DATA1 DATA1 8.63 8.57 8.61 8.69	0. DATA2 .21376 .20587	DATA1 9.15 9.35 9.55 9.45	ENTRATION(TIME 5. DATA2 .28212 .30842 .33471 .32156	DATA2) (MIN.) DATA1 10.00 10.15 9.95 10.15	FOR RUN 2 10. DATA2 .39387 .41359 .38730 .41359	-B-12419 DATA1 10.75 10.65 10.68 10.80	- 384-8 15. DATA2 .49248 .47933 .48328 .49905 .48853
III-30 SANPLE POSITION A B C D AVERAGE S.D.	DIMENS	0. DATA2 21376 .20587 .21113 .22164 .21310 .00569	DATA1 9.15 9.35 9.55 9.45	ENTRATION(TIME 5. DATA2 .28212 .30842 .33471 .32156 .31170	DATA2) (MIN.) DATA1 10.00 10.15 9.95 10.15	FOR RUN 2 	-B-12419 DATA1 10.75 10.65 10.68 10.80	- 384-E 15. DATA2 .4924E .47933 .4832E .49905 .48853
III-30 SAMPLE POSITION A B C D AVERAGE S.D. TEMPERATE	DIMENS DATA1 8.63 8.57 8.61 8.69 URE : 2	0. DATA2 .21376 .20587 .21113 .22164 .21310 .00569	DATA1 9.15 9.35 9.55 9.45	ENTRATION(TIME 5. DATA2 .28212 .30842 .33471 .32156 .31170	DATA2) (MIN.) DATA1 10.00 10.15 9.95 10.15	FOR RUN 2 	-B-12419 DATA1 10.75 10.65 10.68 10.80	- 384-B DATA2 .49248 .47933 A8328
III-30 SAMPLE POSITION A B C D AVERAGE S.D. TEMPERATE PRESSURE	DIMENS DATA1 8.63 8.57 8.61 8.69 URE : 2 : 7	O. DATA2 .21376 .20587 .21113 .22164 .21310 .00569 20.20°C 65 MM HG	DATA1 9.15 9.35 9.55 9.45	ENTRATION(TIME 5. DATA2 .28212 .30842 .33471 .32156 .31170	DATA2) (MIN.) DATA1 10.00 10.15 9.95 10.15	FOR RUN 2	-B-12419 DATA1 10.75 10.65 10.68 10.80	- 384-8 15. DATA2 .49248 .47933 .48328 .49905 .48853

	DIMENS		OOL CONC	ENTRATION	(DATA2) F	FOR RUN 2	-B-14410	- 517-B
SAMPLE POSITION					E (MIN.)			-
			DATA1	5. Data2	DATAI	IO. Data2	DATA1	15. DATA2
A		.21384		.34354		.44279	11.40	.58175
				.35677				.55528
		.20193						.54204
D	8.45	.19134	9.62	.34618	10.55	-46926	11.15	.54866
AVERAGE		.20458	. * -	.34916		.45768		.55693
S.D.		.00883		.00498		.01507		.01507
TEMPERATU	DE . 7	0 50/0						
PRESSURE								
				8.52	8.40	8.47		
				AVERAGI				
				CONTENT O ENTRATION		FOR RUN 2		
III-32 SAMPLE				ENTRATION	(DATA2)	FOR RUN 2		
III-32 SAMPLE	DIMENS	IONLESS P 	3403 LOO	ENTRATION TIN	(DATA2) E (NIN.)	FOR RUN 2	B-16401	- 670-B
III-32 SAMPLE	DIMENS	IONLESS P 	DOL CONC	ENTRATION TIM 5. DATA2	(DATA2) E (MIN.) DATA1	FOR RUN 2	B-16401	- 670-B
III-32 SAMPLE POSITION	DIMENS	O. DATA2	DOL CONC	ENTRATION TIM 5. DATA2	(DATA2) E (NIN.) DATA1	FOR RUN 2	-B-16401 DATA1	- 670-B 15. DATA2
III-32 SAMPLE POSITION	DIMENS	IONLESS P 0. DATA2 .23127	DOL CONC Data1 10.00	ENTRATION TIM 5. DATA2 .37420	(DATA2) E (NIN.) DATA1 11.20	FOR RUN 2	-B-16401 DATA1 12.25	- 670-B
III-32 SAMPLE POSITION	DIMENS	IONLESS P 0. DATA2 .23127	DOL CONC DATA1 10.00 10.00	ENTRATION TIM 5. DATA2 .37420 .37420	(DATA2) E (MIN.) DATA1 11.20 11.15	FOR RUN 2	-B-16401 DATA1 12.25 11.95	- 670-B
III-32 SAMPLE POSITION A B	DIMENS	O. DATA2 .23127 .21539 .21539	DOL CONC DATA1 10.00 10.00	ENTRATION TIM 5. DATA2 .37420 .37420 .42714	(DATA2) E (MIN.) DATA1 11.20 11.15 11.35	FOR RUN 2	-B-16401 DATA1 12.25 11.95 11.90	- 670-B I5. DATA2 -67197 .63226 .62565
III-32 SAMPLE POSITION A B C D	DIMENS	O. DATA2 .23127 .21539 .21539 .22863	DOL CONC DATA1 10.00 10.00 10.40	ENTRATION TIM 5. DATA2 .37420 .37420 .42714 .42714	(DATA2) E (NIN.) DATA1 11.20 11.15 11.35 11.20	FOR RUN 2	-B-16401 DATA1 12.25 11.95 11.90	- 670-B 15. DATA2 .67197 .63226 .62565
III-32 SAMPLE POSITION A B C	DIMENS	O. DATA2 .23127 .21539 .21539	DOL CONC DATA1 10.00 10.00 10.40	ENTRATION TIM 5. DATA2 .37420 .37420 .42714	(DATA2) E (NIN.) DATA1 11.20 11.15 11.35 11.20	FOR RUN 2	-B-16401 DATA1 12.25 11.95 11.90	- 670-B
III-32 SAMPLE POSITION A B C D AVERAGE	DIMENS	O. DATA2 .23127 .21539 .21539 .22863 .22267 .00734	DOL CONC DATA1 10.00 10.00 10.40	ENTRATION TIM 5. DATA2 .37420 .37420 .42714 .42714 .40067	(DATA2) E (NIN.) DATA1 11.20 11.15 11.35 11.20	FOR RUN 2	-B-16401 DATA1 12.25 11.95 11.90	- 670-B
III-32 SAMPLE POSITION A A A B C D A VERAGE S.D. TEMPERATU	DIMENS DATA1 8.92 8.80 8.80 8.90 RE : 2 : 7	IONLESS P 	DOL CONC DATA1 10.00 10.00 10.40 10.40	ENTRATION TIM 5. DATA2 .37420 .37420 .42714 .42714 .40067	(DATA2) E (NIN.) DATA1 11.20 11.15 11.35 11.20	FOR RUN 2	-B-16401 DATA1 12.25 11.95 11.90	- 670-B 15. DATA2 .67197 .63226 .62565 .63226

				(MIN_)			
DATA1		UATAI		DATAI	DATA2		DATA2
		8.80	.21513	8.89	.22685	8.95	
8.71	.20342	8.81	.21644	8.90	.22815	9.00	.24117
8.73	.20602	8.78	.21253	8.86	.22295	8.97	.23727
8.70	.20211	8.78	.21253	8.90	.22815	8.99	.23987
							.23824
	.00159		.00169		.00213		.0025(
RE : 1	9.75′C						
		and the second					
ATED D							
MEASUR	ENENTS OF	OXYGEN	CONTENT OF	DILUTE	I SAMPLES	(DATA1,P	PH) ANI
MEASUR DIMENS	ENENTS OF	OXYGEN	ENTRATION	DATA2)	FOR RUN 2	(BATA1,P -C- 7640	PM) ANI - 145-1
MEASUR DIMENS	ENENTS OF	OXYGEN ODL CONC	ENTRATION(DATA2)	FOR RUN 2	(DATA1,P -C- 7640 	PM) ANI - 145-1
DIMENS	ENENTS OF Ionless F 	OXYGEN OOL CONC Data1	ENTRATION TIME 5. Data2	DATA2) (MIN.) DATA1	FOR RUN 2 10. Data2	-C- 7640 	- 145-I
DIMENS	ENENTS OF IONLESS P 	DXYGEN DOL CONC DATA1 9.14	ENTRATION TIME 5. DATA2 .26367	DATA2) (MIN.) DATA1 9.38	FOR RUN 2 	-C- 7640 BATA1 9.53	- 145-H
DIMENS	EMENTS OF IONLESS F O. DATA2	DXYGEN OOL CONC DATA1 9.14 9.15	ENTRATION TIME 5. DATA2 .26367 .26500	DATA2) (MIN.) DATA1 9.38	FOR RUN 2 	-C- 7640 BATA1 9.53 9.55	- 145-H
DIMENS DATA1 8.82 8.80 8.87	EMENTS OF IONLESS F DATA2 .22133 .21868 .22794	DXYGEN DOL CONC DATA1 9.14 9.15 9.12	ENTRATION TIME 5. DATA2 .26367 .26500 .26103	DATA2) (MIN.) DATA1 9.38 9.35 9.30	FOR RUN 2 	-C- 7640 BATA1 9.53 9.55 9.45	- 145-1 15. DATA2 .31529 .31793 .30470
DIMENS DATA1 8.82 8.80 8.87	EMENTS OF IONLESS P 	DXYGEN DOL CONC DATA1 9.14 9.15 9.12	ENTRATION TIME 5. DATA2 .26367 .26500	DATA2) (MIN.) DATA1 9.38 9.35 9.30	FOR RUN 2 	-C- 7640 BATA1 9.53 9.55 9.45	- 145-1 15. DATA .31529 .31793 .30470
DIMENS DATA1 8.82 8.80 8.87	EMENTS OF IONLESS F DATA2 .22133 .21868 .22794	DATA1 9.14 9.12 9.17	ENTRATION TIME 5. DATA2 .26367 .26500 .26103	DATA2) (MIN.) DATA1 9.38 9.35 9.30	FOR RUN 2 	-C- 7640 BATA1 9.53 9.55 9.45	- 145-1 15. DATA2 .31529 .31793 .30470
DIMENS DATA1 8.82 8.80 8.87	EMENTS OF IONLESS P 	DATA1 9.14 9.12 9.17	ENTRATION TIME 5. DATA2 .26367 .26500 .26103 .26765	DATA2) (MIN.) DATA1 9.38 9.35 9.30	FOR RUN 2 10. DATA2 .29544 .29147 .28485 .28750	-C- 7640 BATA1 9.53 9.55 9.45	- 145-1 15. DATA .31529 .31793 .30470 .30999
	8.70 8.71 8.73 8.70 E : 1 : 7 ICENTRA	8.70 .20211 8.71 .20342 8.73 .20602 8.70 .20211 .20342 .00159 E : 19.75 ⁻ C : 765 MM HG CENTRATION OF ATED DISTILLED	BATA1 BATA2 BATA1 8.70 .20211 8.80 8.71 .20342 8.81 8.73 .20602 8.78 8.70 .20211 8.78 .20342 .00159 E : 19.75°C : 765 MM HG ICENTRATION OF ATED DISTILLED WATER	BATA1 DATA2 DATA1 DATA2 8.70 .20211 8.80 .21513 8.71 .20342 8.81 .21644 8.73 .20602 8.78 .21253 8.70 .20211 8.78 .21253 .20342 .21416 .00159 .00169 :E : 19.75°C : 765 MM HG : 8.66 :CENTRATION OF : 8.66 : 8.66 :ATED DISTILLED WATER AVERAGE	BATA1 DATA2 DATA1 DATA2 DATA1 8.70 .20211 8.80 .21513 8.89 8.71 .20342 8.81 .21644 8.90 8.73 .20602 8.78 .21253 8.86 8.70 .20211 8.78 .21253 8.90 .20342 .21416 .00159 .00169 :E : 19.75 ° C .765 MM HG .8.66 8.65	BATA1 BATA2 BATA1 BATA2 BATA1 DATA1 DATA1 <th< td=""><td>DATA1 DATA1 DATA1 DATA2 DATA1 DATA1 DATA2 DATA1 DATA1 DATA2 DATA1 <th< td=""></th<></td></th<>	DATA1 DATA1 DATA1 DATA2 DATA1 DATA1 DATA2 DATA1 DATA1 DATA2 DATA1 DATA1 <th< td=""></th<>

SAMPLE				TINE	(MIN.)			
POSITION		0.		5.		10		15
	DATA1	DATA2	TATA1	DATA2	DATA1	DATA2	DATA1	DATA2
A			9.10	.30402				
B	8.51	.22594	9.27	.32651	10.10	.43636	10.50	.48929
C	8.48	.22197	9.41	.34504	10.10	.43636	10.55	.49591
1	8.54	.22991	9.33	.33445	10.05	.42974	10.75	.52238
AVERAGE		.22560		.32751		.43966		.50087
S.D.		.00287		.01507		.00993		.01271
TEMPERATU	RE : 2	0.50°C						
PRESSURE								
				: 8.20				
AIR SATU	RATED D	ISTILLED	WATER	AVERAGE	8.220			
TABLE	MEASUR	EMENTS OF	OXYGEN	CONTENT OF	BILUTE	D SAMPLES	(DATA1,F 2-C-14410	'PM) AND - 517-8
III-36	DIMENS	EMENTS OF Ionless P	OXYGEN Dol Conc 	ENTRATION(DATA2)	FOR RUN 2	(DATA1,F 2-C-14410	PM) AND - 517-B
III-36 Sample	DIMENS	EMENTS OF Ionless P 	OXYGEN Dol Conc 	ENTRATION(DATA2) I	FOR RUN 2	(DATA1,F 2-C-14410	PM) AND - 517-9
III-36 Sample	DIMENS	IONLESS P 	DOL CONC	ENTRATION(TIME 5. DATA2	DATA2) (MIN.) DATA1	FOR RUN 2	2-C-14410	- 517-B
III-36 SAMPLE Position	DIMENS	IONLESS P 0. DATA2 -23180	DOL CONC	ENTRATION(TIME 5. DATA2 .39476	DATA2) (MIN.) DATA1 10.70	FOR RUN 2 10. DATA2 -48088	DATA1	- 517-8
III-36 SAMPLE Position A B	DIMENS	IONLESS P 0. DATA2 -23180	DOL CONC	ENTRATION(TIME 5. DATA2	DATA2) (MIN.) DATA1 10.70	FOR RUN 2 10. DATA2 -48088	DATA1	- 517-8
III-36 SAMPLE POSITION A B C	DIMENS	IONLESS P DATA2 .23180 .22783 .20928	DOL CONC	ENTRATION(TIME 5. DATA2 .39476	DATA2) (MIN.) DATA1 10.70 10.80 10.70	FOR RUN 2 10. DATA2 .48088 .49412 .48088	DATA1 11.40 11.35 11.40	- 517-8 15. DATA2 .57361 .56699 .57361
III-36 SAMPLE POSITION A B	DIMENS	IONLESS P DATA2 .23180 .22783 .20928	DOL CONC DATA1 10.05 9.95	ENTRATION(TIME 5. DATA2 .39476 .38151	DATA2) (MIN.) DATA1 10.70 10.80	FOR RUN 2 10. DATA2 .48088 .49412	DATA1	- 517-8 15. DATA2 .57361 .56699 .57361
III-36 SAMPLE POSITION A B C D AVERAGE	DIMENS	IONLESS P 	DOL CONC DATA1 10.05 9.95 9.75	ENTRATION(TIME 5. DATA2 .39476 .38151 .35501 .38814 .37986	DATA2) (MIN.) DATA1 10.70 10.80 10.70	FOR RUN 2 10. DATA2 .48088 .49412 .48088 .47425 .48253	DATA1 11.40 11.35 11.40	- 517-B 15. DATA2 .57361 .56699 .57361 .54712 .56533
III-36 SAMPLE POSITION A B C D	DIMENS	IONLESS P 	DOL CONC DATA1 10.05 9.95 9.75	ENTRATION(TIME 5. DATA2 .39476 .38151 .35501 .38814	DATA2) (MIN.) DATA1 10.70 10.80 10.70	FOR RUN 2 10. DATA2 .48088 .49412 .48088 .49425	DATA1 11.40 11.35 11.40	- 517-8 15. DATA2 .57361 .56699 .57361 .54712
III-36 SAMPLE POSITION A B C D AVERAGE	DIMENS	O. DATA2 .23180 .22783 .20928 .23578 .22617 .01015	DOL CONC DATA1 10.05 9.95 9.75	ENTRATION(TIME 5. DATA2 .39476 .38151 .35501 .38814 .37986	DATA2) (MIN.) DATA1 10.70 10.80 10.70	FOR RUN 2 10. DATA2 .48088 .49412 .48088 .47425 .48253	DATA1 11.40 11.35 11.40	- 517-E
III-36 SAMPLE POSITION A B C D AVERAGE S.D.	DIMENS DATA1 8.82 8.79 8.65 8.85 8.85 	IONLESS P 	DOL CONC DATA1 10.05 9.95 9.75	ENTRATION(TIME 5. DATA2 .39476 .38151 .35501 .38814 .37986	DATA2) (MIN.) DATA1 10.70 10.80 10.70 10.65	FOR RUN 2 10. DATA2 .48088 .49412 .48088 .47425 .48253 .00722	DATA1 11.40 11.35 11.40	- 517-E

SANFLE POSITION				TINE	(MIN.)			
- USI 1 I UR		0. DATA2	DATA1	5. Data2	DATA1	10. DATA2	IATA1	15. DATA2
A B C D	8.60 8.60 8.75 8.80	.20310 .20310 .22302 .22966	10 25	.42219 .42882 .41555 .38899	11 10	53505	12.05	44119
AVERAGE S.D.		.21472 .01185		.41389 .01512		.53505		.65023 .00804
XYGEN CO AIR SATU	: 7 Incentra Irated d	65 NM HG TION OF ISTILLED	WATER	: 8.50 Average	8.543			
				CONTENT OF				
III-38 Sanple	DIMENS		OOL CONC	ENTRATION	UATA2) I		-0- 5214	- 68-8
11-38 AMPLE	DIMENS	O. DATA2	POOL CONC	ENTRATION() TIME 5. DATA2	DATA2) (MIN.) DATA1	FDR RUN 4 10. Data2	-0- 5214 Data1	- 68-8 15. DATA2
A B A B C	DIMENS DATA1 	0. DATA2 .20814 .20152 .19887	DATA1 BATA1 8.90 8.87 8.83	ENTRATION() Time 5.	DATA2) (HIN.) DATA1 8.97 8.95 8.98	FDR RUN 4	-O- 5214 DATA1 9.10 9.05 9.07	- 68-B 15. DATA2 .24122 .23461 .23725
ANPLE OSITION A B C D AVERAGE	DIMENS DATA1 8.85 8.80 8.78 8.78 8.78	O. DATA2 .20814 .20152 .19887 .19887	DATA1 9.90 8.90 8.87 8.83 8.83 8.85	ENTRATION(TIME 5. DATA2 .21476 .21078 .20549	DATA2) (NIN.) DATA1 8.97 8.95 8.98 8.95	FDR RUN 4 10. DATA2 .22402 .22137 .22534 .22137	-O- 5214 DATA1 9.10 9.05 9.07 9.05	- 68-H 15. DATA2 .24122 .23461 .23725 .23461

SAMPLE				TINE	E (NIN.)			
POSITION		0.		30.		50.		90.
			DATA1	DATA2	DATAI	DATA2		IATA2
A				.21082				
B	8.60	.18705	8.75	.20686	8.88	.22403	9.05	.24648
C	8.70	.20026	8.85	.22007	8.91	.22799	9.02	.24252
Ð	8.70	.20026	8.80	.21346	8.95	.23327	9.01	.24119
AVERAGE		.19630		.21280		.22799		.24252
S.D.		.00544		.00481		.00337		.00247
TENPERATU	RE : 2	0.40′C						
RESSURE		65 NM HG						
				: 8.71				
AIR SATU	IRATED D	ISTILLED	WATER	AVERAGI	E 8.680			
				CONTENT OF				
III-40 				ENTRATION	(BATA2)	FOR RUN 4		
III-40 SAMPLE			2001 CONC	ENTRATION	(DATA2) E (NIN.)	FOR RUN 4	-0- 6209 	- 96-H
III-40 SAMPLE		IONLESS	DATA1	ENTRATION Tini 5. Data2	(DATA2) E (MIN.) BATA1	FOR RUN 4	-0- 6209	- 96-E
III-40 SAMPLE	DIMENS	O. DATA2	DATA1	ENTRATION TIN 5. DATA2 .21738	(DATA2) E (MIN.) DATA1 B.88	FOR RUN 4	-0- 6209 DATA1 9.05	- 96-E
III-40 SAMPLE POSITION	DIMENS	O. DATA2	DATA1	ENTRATION TIN 5. DATA2 .21738	(DATA2) E (MIN.) DATA1 B.88	FOR RUN 4	-0- 6209 DATA1 9.05	- 96-E
III-40 SAMPLE POSITION A	DIMENS	O. DATA2 .20418	DATA1 8.70 8.80	ENTRATION TIN 5. DATA2 .21738 .23059	(DATA2) E (MIN.) DATA1 8.88 8.90	FOR RUN 4	-0- 6209 DATA1 9.05 9.10	- 96-E
III-40 SAMPLE POSITION A B	DIMENS	0. DATA2 .20418 .19757 .21078	DATA1 8.70 8.80 8.72	ENTRATION TIM 5. DATA2 .21738 .23059 .22002	(DATA2) E (MIN.) DATA1 8.88 8.90 8.84	FOR RUN 4	-0- 6209 DATA1 9.05 9.10 9.08	- 96-E
III-40 SAMPLE POSITION A B C	DIMENS DATA1 8.60 8.55 8.65 8.65 8.60	0. DATA2 .20418 .19757 .21078	DATA1 8.70 8.80 8.72	ENTRATION TIN 5. DATA2 .21738 .23059 .22002	(DATA2) E (MIN.) DATA1 8.88 8.90 8.84	FOR RUN 4	-0- 6209 DATA1 9.05 9.10 9.08	- 96-E
III-40 SAMPLE POSITION A B C D	DIMENS DATA1 8.60 8.55 8.65 8.65 8.60	0. DATA2 .20418 .19757 .21078 .20418	DATA1 8.70 8.80 8.72	ENTRATION TIN 5. DATA2 .21738 .23059 .22002 .21738	(DATA2) E (MIN.) DATA1 8.88 8.90 8.84	FOR RUN 4 DATA2 .24115 .24379 .23587 .24379	-0- 6209 DATA1 9.05 9.10 9.08 8.95	- 96-E
III-40 SAMPLE POSITION A B C D AVERAGE S.D. TEMPERATU	DIMENS DATA1 8.60 8.55 8.65 8.60 NRE : 2	O. DATA2 .20418 .19757 .21078 .20418 .20418 .00467 O.40*C	DATA1 8.70 8.80 8.72	ENTRATION TIN 5. DATA2 .21738 .23059 .22002 .21738 .22134	(DATA2) E (MIN.) DATA1 8.88 8.90 8.84	FOR RUN 4 	-0- 6209 DATA1 9.05 9.10 9.08 8.95	- 96-B 15. DATA2 .26360 .27020 .26756
III-40 SAMPLE POSITION A B C D AVERAGE S.D.	DIMENS DATA1 8.60 8.55 8.65 8.60 JRE : 2 : 7	O. DATA2 .20418 .19757 .21078 .20418 .20418 .00467 O.40°C 65 MM HG	DATA1 8.70 8.80 8.72 8.70	ENTRATION TIN 5. DATA2 .21738 .23059 .22002 .21738 .22134	(DATA2) F E (MIN.) DATA1 B.88 8.90 8.84 8.90 8.84 8.90	FOR RUN 4 	DATA1 9.05 9.10 9.08 8.95	- 96-E

SAMPLE POSITION				TINE	(HIN.)			
PUSITION		0.		30.		60.		90.
		DATA2		DATA2		DATA2		DATA2
A	8.23	.19838	8.31	.20885	8.48	.23111	8.60	.24682
B	8.25	.20100	8.30	.20755 .22064	8.40	.22064	8.58	.24420
		.18791	8.40	.22064	8.47	.22980	8.60	.24682
D D	8.20	.19446	8.35	.21409	8.45	.22/18	8.70	. 23791
AVERAGE		.19544		.21278		.22718		.24943
S.D.		.00493		.00515		.00403		.00614
TEMPERATU	RE : 2	0.00'C						
RESSURE	: 7	65 NM HG						
XYGEN CO	NCENTRA	TION OF		: 8.10	8.15	8.09		
AIR SATU	IRATED D	ISTILLED	WATER	AVERAGE				·
ARI F	MEASUR	ENENTS DI	F NYYGEN	CONTENT OF	NTI IITE	TI SAMPLES	(1)4741.P	PM) ANI
IABLE III-42	MEASUR DIMENS	EMENTS OF	F OXYGEN Pool Conc	CONTENT OF Entration(DILUTE Data2)	D SAMPLES For Run 4	(DATA1,P -0- 7205	PM) ANI - 129-1
TABLE III-42	MEASUR DIMENS	IONLESS	POOL CONC	CONTENT OF Entration(IATA2)	D SAMPLES For Run 4	(DATA1,P -0- 7205	PM) ANI - 129-I
III-42 Gample	MEASUR DIMENS	IONLESS	POOL CONC	ENTRATION(IATA2)	FOR RUN 4	(DATA1,P -0- 7205	PM) ANI - 129-I
II-42 CAMPLE	DIMENS	O.	°OOL CONC	ENTRATION(Time 5.	DATA2) (NIN.)	FOR RUN 4	-0- 7205	- 129-1
II-42 CAMPLE	DIMENS	O.	POOL CONC	ENTRATION(TIME 5. DATA2	DATA2) (NIN.) DATA1	FOR RUN 4 10. Data2	-0- 7205	- 129-1
III-42 GAMPLE	DIMENS	O.	POOL CONC	ENTRATION(TIME 5. DATA2	DATA2) (NIN.) DATA1 9.55	FOR RUN 4	-O- 7205 DATA1 9.76	- 129-1 15. DATA:
III-42 GAMPLE Position A B	DIMENS	O. UATA2	POOL CONC	ENTRATION(TIME 5. DATA2 .25616 .26934	DATA2) (NIN.) DATA1 9.55	FOR RUN 4 10. Data2 	-O- 7205 DATA1 9.76 9.75	- 129-1 15. DATA2 .34312 .34180
III-42 GAMPLE OSITION A B C	DIMENS DATA1 8.90 8.85 8.78	0. UATA2 .22981 .22322 .21400	POOL CONC DATA1 9.10 9.20 9.30	ENTRATION(TIME 5. DATA2 .25616 .26934 .28251	DATA2) (NIN.) DATA1 9.55 9.40 9.50	FOR RUN 4	-O- 7205 DATA1 9.76 9.75 9.82	- 129-1 15. DATA2 .34312 .34180 .3510
A BAMPLE SAMPLE SAMPLE	DIMENS	0. UATA2 .22981 .22322 .21400	POOL CONC Data1 9.10 9.20	ENTRATION(TIME 5. DATA2 .25616 .26934	DATA2) (NIN.) DATA1 9.55 9.40	FOR RUN 4	-O- 7205 DATA1 9.76 9.75	- 129-1 15. DATA .34312 .34180 .3510
LII-42 CAMPLE COSITION A B C	DIMENS DATA1 8.90 8.85 8.78	0. UATA2 .22981 .22322 .21400	POOL CONC DATA1 9.10 9.20 9.30	ENTRATION(TIME 5. DATA2 .25616 .26934 .28251	DATA2) (NIN.) DATA1 9.55 9.40 9.50	FOR RUN 4	-O- 7205 DATA1 9.76 9.75 9.82	- 129-1 15. DATA2 .34312 .34180 .3510
A B A B C D	DIMENS	O. UATA2 .22981 .22322 .21400 .22586	POOL CONC DATA1 9.10 9.20 9.30	ENTRATION(TIME 5. DATA2 .25616 .26934 .28251 .27329	DATA2) (NIN.) DATA1 9.55 9.40 9.50	FOR RUN 4	-O- 7205 DATA1 9.76 9.75 9.82	- 129-1 15. DATA: .34312 .34180 .35103 .34834
III-42 SAMPLE POSITION A B C D AVERAGE S.D.	DIMENS	O. UATA2 .22981 .22322 .21400 .22586 .22322 .00582	POOL CONC DATA1 9.10 9.20 9.30	ENTRATION(TIME 5. DATA2 .25616 .26934 .28251 .27329 .27032	DATA2) (NIN.) DATA1 9.55 9.40 9.50	FOR RUN 4	-O- 7205 DATA1 9.76 9.75 9.82	- 129-1 15. DATA .3431 .3418 .3510 .3483 .3483
III-42 SAMPLE Position A B C D J Average	DIMENS DATA1 8.90 8.85 8.78 8.87 IRE : 2	O. UATA2 .22981 .22322 .21400 .22586 .22322 .00582	POOL CONC DATA1 9.10 9.20 9.30	ENTRATION(TIME 5. DATA2 .25616 .26934 .28251 .27329 .27032	DATA2) (NIN.) DATA1 9.55 9.40 9.50	FOR RUN 4	-O- 7205 DATA1 9.76 9.75 9.82	- 129-1 15. DATA: .34312 .34184 .35102 .34834 .34604

SAMPLE TIME (MIN.) 051TION 0. 30. 60. 90. 0 DATA1 DATA1 DATA2 DATA1 DATA2 DATA1 A 8.79 .22586 8.90 .24035 9.00 .25352 9.25 .28637 B 8.70 .21400 8.97 .24957 9.10 .26670 9.22 .28257 C 8.72 .21663 8.82 .22781 9.03 .25748 9.20 .27985 D 8.68 .21136 8.90 .24035 9.01 .25484 9.18 .2722 AVERAGE .21676 .24002 .25814 .20155 .0034 S.D .00546 .00700 .00515 .0034 YERESUKE : 765 MM HG .2850 8.60 8.55 AIL SATURATED DISTILLED WATER AVERAGE 8.50 8.60 8.55 AIL SATURATED DISTILLED WATER TIME (MIN.) .05110N .0 .5. 10. 15		DIMENS			ENTRATION(-0- 7205	- 129-9
0. 30. 60. 90. A DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1	SAMPLE POSITION						-		
DATA1 DATA2 DATA1 DATA2 PATA1 DATA1 DATA1 <th< th=""><th></th><th></th><th>0.</th><th></th><th>30.</th><th>1.</th><th>50.</th><th></th><th>90.</th></th<>			0.		30.	1.	50.		90.
A B.77 .22586 B.70 .24035 9.00 .25352 9.25 .28643 B B.70 .21400 B.97 .24957 9.10 .26670 9.22 .28257 C B.72 .21663 B.82 .22781 9.03 .25748 9.20 .27960 D B.68 .21136 B.90 .24035 9.01 .25484 9.18 .2772 AVERAGE .21696 .24002 .25814 .28152 S.D. .00546 .00700 .00515 .0034 YEMPERATURE : 20.30°C		DATA1	DATA2	DATA1	IIATA2	DATAI	DATA2	DATA1	IIATA2
B 8.70 .21400 8.97 .24957 9.10 .26670 9.22 .2825 C 8.72 .21663 8.82 .22981 9.03 .25748 9.20 .27983 D 8.68 .21136 8.90 .24035 9.01 .25484 9.18 .2772 AVERAGE .21696 .24002 .25814 .28152 .00344 S.D .00546 .00700 .00515 .00344 YEMPERATURE : 20.30°C	A								
C 8.72 .21663 8.82 .22981 9.03 .25748 9.20 .27984 B 8.68 .21136 8.90 .24035 9.01 .25484 9.18 .2722 AVERAGE .21696 .24002 .25814 .28152 .0034 S.D .00546 .00700 .00515 .0034 YRESSURE : 765 NH B .0070 .00515 .0034 YRESSURE : 765 NH B .0070 .00515 .0034 YRESSURE : 765 NH AVERAGE 8.550 .0070 .00515 .0034 YREAGE DINENSIONLESS POOL CONCENTRATION (DATA2) FDR RUN 4-0- 8200-167-1 SANPLE TIME MIN.) .0157 .0164 .0225 .2	B	8.70	.21400	8.97	.24957	9.10	.26670	9.22	.28251
D 8.68 .21136 8.90 .24035 9.01 .25484 9.18 .2722 AVERAGE .21696 .24002 .25814 .28152 S.D .00546 .00700 .00515 .00347 IEMPERATURE : 20.30°C .25814 .28152 RESSURE : 765 NH HG .27581 .00347 NYGEN CONCENTRATION OF : 8.50 8.60 8.55 AIR SATURATED DISTILLED WATER AVERAGE 8.550 YABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1, PPH) AND III-44 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-0- 8200- 167-1 SAMPLE TIME (MIN.) 'OSITION 0. 5. A 8.80 .21643 9.25 .27592 9.70 .33522 10.40 .42243 B 8.0 .21643 9.25 .27592 9.70 .33522 10.40 .42043 A 8.80 .21643 9.22 .27197 9.80 .34839 10.35 .42084 C 8.75 .21004 9.20 .26934 <	С	8.72	.21663	8.82	.22981	9.03	.25748	9.20	.27988
S.B. .00546 .00700 .00515 .0034 IEMPERATURE : 20.30 ° C YRESSURE : 765 MM HG DYTOEN CONCENTRATION OF : 8.50 8.60 8.55 AIR SATURATED DISTILLED WATER AVERAGE 8.550 YABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1, PPH) AND YABLE AVERAGE 8.550 YABLE DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-D- 8200- 167-1 YABLE TIME (MIN.) YOSITION 0. 5. YABLE DATA1 DATA2 DATA1 A 8.80 .21663 9.25 .27592 A 8.80 .21663 9.25 .27592 9.70 .33522 10.40 .42743 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42084 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .4011 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38793 AVERA	[l								
S.B. .00546 .00700 .00515 .0034 IEMPERATURE : 20.30 ° C YRESSURE : 765 MM HG DYTOEN CONCENTRATION OF : 8.50 8.60 8.55 AIR SATURATED DISTILLED WATER AVERAGE 8.550 YABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1, PPH) AND YABLE AVERAGE 8.550 YABLE DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-D- 8200- 167-1 YABLE TIME (MIN.) YOSITION 0. 5. YABLE DATA1 DATA2 DATA1 A 8.80 .21663 9.25 .27592 A 8.80 .21663 9.25 .27592 9.70 .33522 10.40 .42743 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42084 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .4011 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38793 AVERA	AVERAGE		.21696		.24002		.25814		.28152
PRESSURE : 765 NM HG DXYGEN CONCENTRATION OF : 8.50 8.60 8.55 AIR SATURATED DISTILLED WATER AVERAGE 8.550 PABLE NEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPH) AND III-44 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-0- 8200- 167-1 SAMPLE TIME (MIN.) OSITION 0. 5. 10. 15. A 8.80 .21663 9.25 .27592 9.70 .33522 10.40 .42743 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42084 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40114 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38793 AVERAGE .21927 .27461 .33983 .40933 .40933 S.D. .00639 .00447 .00578 .0157 TEMPERATURE : 20.30 'C .765 NM HG .8.60 8.62 8.72									.00341
PRESSURE : 765 NM HG DXYGEN CONCENTRATION OF : 8.50 8.60 8.55 AIR SATURATED DISTILLED WATER AVERAGE 8.550 PABLE NEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPH) AND III-44 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-0- 8200- 167-1 SAMPLE TIME (MIN.) OSITION 0. 5. 10. 15. A 8.80 .21663 9.25 .27592 9.70 .33522 10.40 .42743 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42084 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40114 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38793 AVERAGE .21927 .27461 .33983 .40933 .40933 S.D. .00639 .00447 .00578 .0157 TEMPERATURE : 20.30 'C .765 NM HG .8.60 8.62 8.72	EMPERATU	RE : 2	0.30'C						
XYGEN CONCENTRATION OF : 8.50 8.60 8.55 AIR SATURATED DISTILLED WATER AVERAGE 8.550 YABLE NEASUREMENTS OF OXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPH) AND YII-44 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-0- 8200- 167-1 SAMPLE TINE (NIN.) YOSITION 0. 5. A 8.80 .21663 9.25 A 8.80 .21663 9.25 .27592 A 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42086 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40110 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38793 AVERAGE .21927 .27461 .33783 .40933 .40933 S.D. .00639 .00447 .00578 .0157 YEMPERATURE : 20.30 'C .7455 MM HG .8.60 8.62 8.72									
AIR SATURATED DISTILLED WATER AVERAGE 8.550 (ABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1, PPH) AND (II-44 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-0- 8200- 167-1 SAMPLE TIME (MIN.) OSITION 0. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A 8.80 .21663 9.25 .27592 9.70 .33522 10.40 .42745 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42086 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40110 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38793 AVERAGE .21927 .27461 .33983 .40933 .40933 S.D. .00639 .00447 .00578 .0157 TEMPERATURE : 20.30'C .765 .8.60 8.62 8.72					: 8.50	8.60	8.55		
TABLE MEASUREMENTS OF DXYGEN CONTENT OF DILUTED SAMPLES(DATA1,PPN) AND III-44 DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-0- 8200- 167-1 SAMPLE SAMPLE O. 5. DATA1 DATA2									
OSITION 0. 5. 10. 15. DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 A 8.80 .21663 9.25 .27592 9.70 .33522 10.40 .42743 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42084 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40116 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38792 AVERAGE .21927 .27461 .33983 .40933 .40933 S.D. .00639 .00447 .00578 .01574 VERPERATURE : 20.301C .00447 .00578 .01574 VYGEN CONCENTRATION OF : 8.60 8.62 8.72	ABLE	MEASUR	EMENTS OF	OXYGEN	CONTENT OF	DILUTEI	SAMPLES	(DATA1,P	PH) ANI
DATA1 DATA2 DATA1 DATA1 DATA2 DATA1 DATA2 DATA1 DATA2 DATA1 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .4083 .40110 .38792 .40110 .33983 .40933 .40933 .5157 .01577 .00578 .01577 .00578 .01577	[ABLE [II-44	MEASUR DINENS	EMENTS OF Ionless P	OXYGEN Dol Conc	CONTENT OF Entration(DILUTEI Data2) F	3 SAMPLES For Run 4	(DATA1,F -0- 8200	PH) ANI - 167-1
A 8.80 .21663 9.25 .27592 9.70 .33522 10.40 .42743 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42086 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40116 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38792 AVERAGE .21927 .27461 .33983 .40933 S.D. .00639 .00447 .00578 .0157 YEMPERATURE : 20.30 °C .27461 .33983 .40933 YGEN CONCENTRATION OF : 8.60 8.62 8.72	TABLE III-44 GAMPLE POSITION	MEASUR DIMENS	EMENTS DF Ionless P	OXYGEN ODL CONC	ENTRATION	DATA2) F	FOR RUN 4	(DATA1,P -0- 8200	PM) ANI - 167-E
A 8.80 .21663 9.25 .27592 9.70 .33522 10.40 .42743 B 8.86 .22454 9.22 .27197 9.80 .34839 10.35 .42086 C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40116 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38792 AVERAGE .21927 .27461 .33983 .40933 S.D. .00639 .00447 .00578 .0157 YEMPERATURE : 20.30 °C .860 8.62 8.72	III-44 GANPLE	MEASUR DIMENS	IDNLESS P	OOL CONC	ENTRATION(Time	DATA2) F (MIN.)	FOR RUN 4-	-0- 8200	- 167-E
C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40110 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38792 AVERAGE .21927 .27461 .33983 .40932 S.D. .00639 .00447 .00578 .01572 'EMPERATURE : 20.30 'C .8.60 8.62 8.72	II-44 GAMPLE	DINENS	IDNLESS P 	DOL CONC	ENTRATION(TIME 5. DATA2	DATA2) F (MIN.)	FOR RUN 4-	-0- 8200 Data1	- 167-E
C 8.75 .21004 9.20 .26934 9.75 .34180 10.20 .40110 D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38792 AVERAGE .21927 .27461 .33983 .40933 S.D. .00639 .00447 .00578 .01573 'EMPERATURE : 20.301C .765 MM HG .8.60 8.62 8.72	II-44 AMPLE OSITION	DIMENS	O. DATA2	DOL CONC	ENTRATION(TIME 5. DATA2	DATA2) F (MIN.) DATA1	FOR RUN 4-	-0- 8200 Data1	- 167-1
D 8.87 .22586 9.29 .28119 9.69 .33390 10.10 .38792 AVERAGE .21927 .27461 .33983 .40932 S.D. .00639 .00447 .00578 .01572 TEMPERATURE : 20.301C .27451 .33983 .40932 YRESSURE : 765 MM HG .00578 .01572 XYGEN CONCENTRATION OF : 8.60 8.62 8.72	III-44 GAMPLE DSITION	DIMENS	IDNLESS P 0. DATA2 .21663	DOL CONC Data1 9.25	ENTRATION(TIME 5. DATA2 .27592	DATA2) F (MIN.) DATA1 9.70	OR RUN 4-	-0- 8200 DATA1 10.40	- 167-1 15. DATA: .42745
S.D00639 .00447 .00578 .0157 EMPERATURE : 20.30'C PRESSURE : 765 NN HG DXYGEN CONCENTRATION DF : 8.60 8.62 8.72	II-44 GAMPLE OSITION A B	DIMENS	O. DATA2 .21663 .22454	DOL CONC Data1 9.25 9.22	ENTRATION(TIME 5. DATA2 .27592 .27197	DATA2) F (MIN.) DATA1 9.70 9.80	OR RUN 4-	-0- 8200 DATA1 10.40 10.35	- 167-1 15. DATA: .4274: .42086
TEMPERATURE : 20.30'C PRESSURE : 765 MM HG DXYGEN CONCENTRATION OF : 8.60 8.62 8.72	A B B B B C	DINENS	0. DATA2 .21663 .22454 .21004	DOL CONC DATA1 9.25 9.22 9.20	ENTRATION(TIME 5. DATA2 .27592 .27197 .26934	DATA2) F (MIN.) DATA1 9.70 9.80 9.75	DR RUN 4-	-0- 8200 BATA1 10.40 10.35 10.20	- 167-1 15. DATA: .4274: .42086 .40110
RESSURE : 765 NN HG DXYGEN CONCENTRATION OF : 8.60 8.62 8.72	A B A B C D	DINENS DATA1 8.80 8.86 8.75 8.87	O. DATA2 .21663 .22454 .21004 .22586	DOL CONC DATA1 9.25 9.22 9.20	ENTRATION(TIME 5. DATA2 .27592 .27197 .26934 .28119	DATA2) F (MIN.) DATA1 9.70 9.80 9.75 9.69	FOR RUN 4- DATA2 .33522 .34839 .34180 .33390	-0- 8200 BATA1 10.40 10.35 10.20	- 167-I 15. DATA2 .42745 .42086 .40110
DXYGEN CONCENTRATION OF : 8.60 8.62 8.72	A A B C D AVERAGE	DINENS DATA1 8.80 8.86 8.75 8.87	IDNLESS P 	DOL CONC DATA1 9.25 9.22 9.20	ENTRATION(TIME 5. DATA2 .27592 .27197 .26934 .28119 .27461	DATA2) F (MIN.) DATA1 9.70 9.80 9.75 9.69	DR RUN 4-	-0- 8200 BATA1 10.40 10.35 10.20	- 167-1 15. DATA: .42745 .42086 .4011(.38792
	A A B C D AVERAGE S.D.	DATA1 DATA1 8.80 8.86 8.75 8.87	O. DATA2 21663 22454 21004 22586 .21927 .00639	DOL CONC DATA1 9.25 9.22 9.20	ENTRATION(TIME 5. DATA2 .27592 .27197 .26934 .28119 .27461	DATA2) F (MIN.) DATA1 9.70 9.80 9.75 9.69	DR RUN 4-	-0- 8200 BATA1 10.40 10.35 10.20	- 167-1 15. DATA: .4274: .42086 .40110 .38792 .40933
	A A B C D AVERAGE S.D. IEMPERATU RESSURE	DINENS DATA1 8.80 8.86 8.75 8.87 8.87	IDNLESS P 	DOL CONC DATA1 9.25 9.22 9.20	ENTRATION(TIME 5. DATA2 .27592 .27197 .26934 .28119 .27461	DATA2) F (MIN.) DATA1 9.70 9.80 9.75 9.69	DR RUN 4-	-0- 8200 BATA1 10.40 10.35 10.20	- 167-1 15. DATA: .4274; .42086 .40110 .38792 .4093;

SANPLE Position				TIME	(MIN.)			
FUSIFIUM		0. Data2	DATA1	30. DATA2	DATA1	60. Data2	DATAI	90. Data2
B	8.42	.21062	8.60 8.66 8.60	.22371 .23156 .22371	8.75 8.75 8.83	.24334	8.95 7.00 9.05	.27607
AVERAGE S.D.				.22534 .00363		.24792 .00467		.27279
PRESSURE Dxygen co	: 7 Incentra			: 8.36 Average				
TABLE	MEASUR	EMENTS OF	OXYGEN	CONTENT OF	DILUTE	D SAMPLES	(IATA1,P	PH) ANI
III-46 SAMPLE	MEASUR DIMENS	EMENTS OF Ionless P	OOL CONC	CONTENT OF ENTRATION(DATA2)	FOR RUN 4-	(IATA1,P -0- 8698 	PM) ANI - 188-B
III-46 SAMPLE	DIMENS	IONLESS P 	OOL CONC	ENTRATION	DATA2) (MIN.) DATA1	FOR RUN 4- 10. DATA2	-0- 8698 	- 188-F
III-46 SAMPLE	DIMENS	IONLESS P 0. DATA2 .21681	DOL CONC DATA1 9.05 9.12 9.10	ENTRATION() TIME 5.	DATA2) (MIN.) DATA1 9.65 9.75 9.60	FOR RUN 4-	-0- 8698 DATA1 10.21 10.20 10.10	- 188-B 15. DATA2 .43120 .42988 .41664
III-46 SAMPLE POSITION A B C	DIMENS	0. DATA2 .21681 .23137 .23137	DOL CONC DATA1 9.05 9.12 9.10	ENTRATION() TIME 5. DATA2 .27768 .28695 .28430	DATA2) (MIN.) DATA1 9.65 9.75 9.60	FOR RUN 4-	-0- 8698 DATA1 10.21 10.20 10.10	- 188 15. DAT -431 .429 .416

SANPLE POSITION				TINE	(HIN.)		• •	
UUTTION	DATA1	DATA2	DATAI	DATA2	DATA1	60. DATA2		DATA2
A		.21004		.22976		.27709	9.03	
	8.43			.24422				
	8.50	.21661	8.80	.25605	8.89	.26789	9.10	.2955(
D	8.50	.21661	8.72	.24554	8.80	.25605	9.00	.28235
AVERAGE				.24389				
S.D.		.00405		.00936		.00752		.00475
TEMPERATU								
RESSURE	: 7	65 MM HG		: 8.21				
HIK SHIU	IKATED D	15111111	WAIER	AVERAGE	8.280			
ABLE II-48	MEASUR Dimens	EMENTS OF	OXYGEN	CONTENT OF	DILUTE DATA2)	D SAMPLES For Run 4	(BATA1,P -A- 5214	PM) ANI - 68-1
II-48	DIMENS	IONLESS F	POOL CONC	ENTRATION()	DATA2)	FOR RUN 4	-A- 5214	- 68-B
II-48 	DIMENS	IONLESS F	900L CONC	ENTRATION()	DATA2) (MIN.)	FOR RUN 4	-A- 5214	- 68-1
II-48 AMPLE	DIMENS	IONLESS F	DOL CONC	ENTRATION(TIME 5. DATA2	DATA2) (MIN.) DATA1	FOR RUN 4 10. Data2	-A- 5214 	- 68-E
II-48 GAMPLE OSITION	DIMENS	IDNLESS F 0. DATA2 .21279	00L CONC	ENTRATION(TIME 5. DATA2 .22214	DATA2) (MIN.) DATA1 8.93	FOR RUN 4 10. DATA2 .23282	-A- 5214 DATA1 9.00	- 68-H
III-48 SAMPLE OSITION A B	DIMENS	O. DATA2 .21279 .20879	00L CONC Data1 8.85 8.81	ENTRATION(TIME 5. DATA2 .22214 .21680	DATA2) (MIN.) DATA1 8.93 8.91	FOR RUN 4 DATA2 .23282 .23015	-A- 5214 DATA1 9.00 9.05	- 68-F
II-48 AMPLE OSITION A B C	DIMENS	0. DATA2 .21279 .20879 .21012	200L CONC DATA1 8.85 8.81 8.79	ENTRATION() TIME 5. DATA2 .22214 .21680 .21413	DATA2) (MIN.) DATA1 8.93 8.91 8.90	FOR RUN 4	-A- 5214 DATA1 9.00 9.05 9.00	- 68-H
II-48 AMPLE OSITION A B C	DIMENS	0. DATA2 .21279 .20879 .21012	200L CONC DATA1 8.85 8.81 8.79	ENTRATION(TIME 5. DATA2 .22214 .21680	DATA2) (MIN.) DATA1 8.93 8.91 8.90	FOR RUN 4	-A- 5214 DATA1 9.00 9.05 9.00	- 68-H
II-48 AMPLE OSITION A B C D AVERAGE	DIMENS	IDNLESS F 	DATA1 DATA1 8.85 8.81 8.79 8.82	ENTRATION(TIME 5. DATA2 .22214 .21680 .21413 .21813 .21780	DATA2) (MIN.) DATA1 8.93 8.91 8.90 8.95	FOR RUN 4	-A- 5214 DATA1 9.00 9.05 9.00 9.03	- 68-H
II-48 AMPLE OSITION A B C D AVERAGE	DIMENS	O. DATA2 .21279 .20879 .21012 .20745	DATA1 DATA1 8.85 8.81 8.79 8.82	ENTRATION() TIME 5. DATA2 .22214 .21680 .21413 .21813	DATA2) (MIN.) DATA1 8.93 8.91 8.90 8.95	FDR RUN 4	-A- 5214 DATA1 9.00 9.05 9.00 9.03	- 68-H
III-48 C SAMPLE OSITION A AVERAGE S.D. IEMPERATU	DINENS DATA1 8.78 8.75 8.76 8.74 JRE : 2	0. DATA2 21279 20879 20112 20745 20979 00197 0.90°C	DATA1 DATA1 8.85 8.81 8.79 8.82	ENTRATION(TIME 5. DATA2 .22214 .21680 .21413 .21813 .21780	DATA2) (MIN.) DATA1 8.93 8.91 8.90 8.95	FOR RUN 4	-A- 5214 DATA1 9.00 9.05 9.00 9.03	- 68-1 15. DATA2 .24217 .2488 .24217 .24617 .24617
III-48 SAMPLE OSITION A A A A VERAGE S.D. IEMPERATU PRESSURE	DINENS DATA1 8.78 8.75 8.76 8.74 JRE : 2 : 7	IDNLESS F 	200L CONC DATA1 8.85 8.81 8.79 8.82	ENTRATION(TIME 5. DATA2 .22214 .21680 .21413 .21813 .21780	DATA2) (MIN.) DATA1 8.93 8.91 8.90 8.95	FOR RUN 4	-A- 5214 DATA1 9.00 9.05 9.00 9.03	- 68-H

SAMPLE POSITION				TIME			· · · · · · · · · · · · · · · · · · ·	
			DATA1	5. Data2	DATA1	10. DATA2		DATA2
A		.20977		.21503		.25189	9.30	
B	8.80	.21240		.22556				
	8.70			.22556				
D	8.79	.21109	8.89	.22425	9.13	.25583	9.20	.26505
AVERAGE				.22260		.25353		.26933
S.D.		.00521		.00440		.00171		.00538
TEMPERATU Pressure		0.257C 65 MM HG						
	NCENTRĂ	TION OF		: 8.65	8.70	8.70		
AIR SATU	IRATED D	ISTILLED	WATER	AVERAGE	8.683	01/0		
	MEASUR	EMENTS DI	F DXYGEN	CONTENT OF	DILUTE	D SAMPLES	(DATA1,P	PH) ANI
11-50	NEASUR DINENS	EMENTS OI Ionless I	F OXYGEN Pool Conc	ENTRATION(DATA2)	FOR RUN 4	(DATA1,P -A- 7205 	PH) ANI - 129-I
TABLE III-50 Sanple Position	NEASUR DINENS	EMENTS OI Ionless I	F OXYGEN Pool Conc	CONTENT OF ENTRATION(TIME	DATA2)	FOR RUN 4	(DATA1,P -A- 7205 	PM) AND - 129-E
III-50 GAMPLE	DINENS	IDNLESS 	POOL CONC	ENTRATION(TIME 5.	DATA2) (HIN.)	FOR RUN 4	-A- 7205 	- 129-E
III-50 GAMPLE	DINENS	IDNLESS 	POOL CONC Data1	ENTRATION(DATA2) (MIN.) DATA1	FOR RUN 4	-A- 7205 	- 129-E 15. Data2
III-50 GAMPLE Cosition	DIMENS	IONLESS / 0. DATA2 .22762	POOL CONC Data1 9.00	ENTRATION(TIME 5. DATA2 .25813	DATA2) (MIN.) DATA1	FOR RUN 4 10. Data2	-A- 7205 DATA1 	- 129-E 15. DATA2
LII-50 GAMPLE COSITION A B	DIMENS	0. DATA2 .22762 .21171	POUL CONC DATA1 9.00 9.10	ENTRATION(TIME 5. DATA2 .25813 .27139	DATA2) (MIN.) DATA1 9.36 9.32	FOR RUN 4	-A- 7205 DATA1 9.40 9.55	- 129-H
AMPLE CSITION C	DIMENS DATA1 8.77 8.65 8.72	IONLESS / DATA2 .22762 .21171 .22099	DOL CONC DATA1 9.00 9.10 9.15	ENTRATION(TIME 5. UATA2 -25813 .27139 .27802	UATA2) (MIN.) UATA1 9.36 9.32 9.30	FOR RUN 4	-A- 7205 DATA1 9.40 9.55 9.40	- 129-H 15. DATA2 .31118 .33107 .31118
III-50 GAMPLE COSITION A B	DIMENS	0. DATA2 .22762 .21171	POUL CONC DATA1 9.00 9.10	ENTRATION(TIME 5. DATA2 .25813 .27139	DATA2) (MIN.) DATA1 9.36 9.32	FOR RUN 4	-A- 7205 DATA1 9.40 9.55	- 129-H 15. DATA2 .31118 .33107 .31118
A B C C C C C C C C C C C C C C C C C C	DIMENS DATA1 8.77 8.65 8.72	IONLESS / DATA2 .22762 .21171 .22099	DOL CONC DATA1 9.00 9.10 9.15	ENTRATION(TIME 5. UATA2 -25813 .27139 .27802	UATA2) (MIN.) UATA1 9.36 9.32 9.30	FOR RUN 4	-A- 7205 DATA1 9.40 9.55 9.40	- 129-H
II-50 CAMPLE OSITION B C D	DIMENS DATA1 8.77 8.65 8.72	IONLESS / 0. DATA2 .22762 .21171 .22099 .21569	DOL CONC DATA1 9.00 9.10 9.15	ENTRATION(TIME 5. DATA2 .25813 .27139 .27802 .27537	UATA2) (MIN.) UATA1 9.36 9.32 9.30	FOR RUN 4	-A- 7205 DATA1 9.40 9.55 9.40	- 129-1 15. DATA2 .31118 .33107 .31118 .32444
A A B C D AVERAGE S.D.	DIMENS DATA1 8.77 8.65 8.72 8.68	O. DATA2 .22762 .21171 .22099 .21569 .21900 .00597	DOL CONC DATA1 9.00 9.10 9.15	ENTRATION(TIME 5. DATA2 .25813 .27139 .27802 .27537 .27073	UATA2) (MIN.) UATA1 9.36 9.32 9.30	FOR RUN 4	-A- 7205 DATA1 9.40 9.55 9.40	- 129- 15. DATA .3111 .3310 .3111 .3244 .3194
AVERAGE	DIMENS DATA1 8.77 8.65 8.72 8.68 RE : 2 : 7	IONLESS / 0. DATA2 .22762 .21171 .22099 .21569 .21900 .00597 0.60°C 65 MM HG	DOL CONC DATA1 9.00 9.10 9.15	ENTRATION(TIME 5. DATA2 .25813 .27139 .27802 .27537 .27073	UATA2) (MIN.) UATA1 9.36 9.32 9.30	FOR RUN 4	-A- 7205 DATA1 9.40 9.55 9.40	- 129-1 15. DATA2 .31118 .33107 .31118 .32444 .31947

SAMPLE Position		· • ·		TIME	(HIN.)			
	DATA1	0. Data2	DATAL	5. Data2	DATA1	DATA2	DATA1	DATA2
A				.29694				~~~~~
	8.70	.21762	9.33	.30090	9.90	.37625	10.10	.40269
C	8.80							
Ţ,	8.70	.21762	9.30	.29694	9.82	.36568	10.20	41591
AVERAGE		.21927		.29727		.36535		. 39443
S.I.		.00720		.00236		.00973		.01709
TENPERATU	RE : 2	0.45°C						
		65 MM HG						
DXYGEN CO	NCENTRA	TION OF		: 8.45	8.57	8.55		
AIR SATU	RATED D	ISTILLED	WATER	AVERAGE	8.523	· .	•	
ABLE	MEASUR	EMENTS OF	OXYGEN	CONTENT OF	DILUTE	D SAMPLES	(DATA1.P	'PM) ANI
				ENTRATION				
ANPLE				TIME	(MIN.)			
POSITION		0.		5.		10.		15
	- . -			υ. ΠΔΤΔ?				

		0.		5.		10.		15.
	DATA1	DATA2	DATA1	DATA2	DATA1	DATA2	DATA1	DATA2
A	8.68	.21412	9.20	.28293	9.90	.37557	10.15	.40866
B	8.65	.21015	9.30	.29617	9.90	.37557	10.38	.43909
C	8.60	.20353	9.35	.30278	9.80	.36234	10.30	.42851
D	8.75	.22338	9.45	.31602	9.97	.38483	10.40	.44174
AVERAGE		.21279		.29948	•	.37458		.42950
S.D.		.00719		.01193		.00802		.01301
TENPERATU	RE : 2	0.5010						
PRESSURE	: 7	65 MM HG				4		
OXYGEN CO	NCENTRA	TION OF		: 8.48	8.60	8.52		
AIR SATU	RATED D	ISTILLED	WATER	AVERAGE	8.533			

SAMPLE POSITION	•			TINE				
			DATA1	5. Data2	DATA1	10. DATA2		IATA2
	8.65		8.80	.21247	8.90		8.95	
С		.20189		.20586	8.80	.21247	8.98	.23629
AVERAGE S.D.		.19825 .00342		.20784 .00424		.22240		.23497 .00719
TEMPERATU Pressure	: 7	65 MM HG						•
		TION OF	WATER	= 8.73 AVERAGE	8.65 8.693	8.70		
								
TABLE III-54	NEASUR	EMENTS OF	OXYGEN	CONTENT OF ENTRATION(DATA2)	FOR RUN 4	(DATA1,P -8- 6209	FM) ANI - 96-I
TABLE III-54 GAMPLE	MEASUR DIMENS	EMENTS OF Ionless F	F OXYGEN Pol Conc	ENTRATION(DATA2) (NIN.)	FOR RUN 4	-B- 6209	- 96-E
TABLE III-54 GAMPLE	MEASUR DIMENS	EMENTS OF IONLESS F 	OXYGEN Dol Conc Data1	ENTRATION(TIME 5. Data2	DATA2) (NIN.) DATA1	FOR RUN 4 10. Data2	-B- 6209 Data1	- 96-B 15. Data2
TABLE III-54 GAMPLE POSITION	MEASUR DIMENS DATA1 	EMENTS OF IONLESS F Data2 .21353	DOL CONC Dol Conc Data1 8.70	ENTRATION(TIME 5. DATA2 .24003	DATA2) (NIN.) DATA1 8.90	FOR RUN 4 10. DATA2 .26652	-B- 6209 DATA1 9.10	- 96-B 15. DATA2
TABLE III-54 Gample Position	MEASUR DIMENS DATA1 	EMENTS OF IONLESS F O. DATA2 .21353 .21353	DOL CONC Dol Conc Data1 8.70	ENTRATION(TIME 5. DATA2 .24003 .24268	DATA2) (NIN.) DATA1 8.90 8.80	FOR RUN 4	-B- 6209 DATA1	- 96-E
TABLE III-54 GANPLE COSITION A B	MEASUR DIMENS DATA1 8.50 8.50	EMENTS OF IONLESS F DATA2 .21353 .21353 .22015	DOL CONC DOL CONC DATA1 8.70 8.72	ENTRATION(TIME 5. DATA2 .24003 .24268	DATA2) (NIN.) DATA1 8.90 8.80 8.85	FOR RUN 4	-B- 6209 DATA1 9.10 9.05	- 96-E
ABLE III-54 GAMPLE OSITION A B C	MEASUR DIMENS DATA1 8.50 8.50 8.55	EMENTS OF IONLESS F DATA2 .21353 .21353 .22015	DOL CONC DOL CONC DATA1 8.70 8.72 8.65	ENTRATION(TIME 5. DATA2 .24003 .24268 .23340	DATA2) (NIN.) DATA1 8.90 8.80 8.85	FOR RUN 4	-B- 6209 DATA1 9.10 9.05 9.00	- 96-H 15. DATA2 .29302 .28640 .27977

OSITION				TINE	(MIN.)			
	DATA1	0. DATA2	DATA1	5. DATA2	DATA1			15. Data2
B	8.65	.20619 .21273 .21142	8.95 9.00 9.05	.24542 .25196 .25850 .25850	9.30 9.40 9.35	.29119 .30426 .29772	9.61 9.70	.33172
AVERAGE S.D.		.21077		.25359 .00542		.29609 .00542		.33828 .00734
EMPERATUR Ressure Xygen con Air satur	: 7	65 NH HG	WATER	: 8.49 Average	8.59 8.547	8.56		
ABLE II-56 	NEASUR DIMENS	EMENTS OF Ionless P	OXYGEN DOL CONC	CONTENT OF	DILUTEI DATA2) I	D SAMPLES(For Run 4-		 PM) ANI - 167-E
ABLE II-56 AMFLE OSITION	NEASUR IJIMENS	EMENTS OF Ionless P 0. Data2	OXYGEN OOL CONC Data1	CONTENT OF ENTRATION() TIME 5. DATA2	DILUTE DATA2) I (MIN.) DATA1	D SAMPLES(FOR RUN 4- IO. DATA2	BATA1,P B- 8200	15.
ABLE II-56 AMFLE OSITION A B C	NEASUR DIMENS DATA1 8.45 8.53 8.45	ENENTS OF IONLESS P 	DXYGEN DOL CONC DATA1 9.15 9.10 9.00	CONTENT OF ENTRATION(TIME 5.	DILUTE) DATA2) I (MIN.) DATA1 9.40 9.60 9.55	0 SAMPLES(OR RUN 4- DATA2 .33715 .36365 .35702	DATA1,P B- 8200 DATA1 9.93 10.00 10.20	15. DATA2 .40737 .41664 .44314

SANFLE Position				TINE	(MIN.)			
0311108		O. Data2		5. Data2	DATAI	10. DATA2	UATA 1	15. DATA:
	8.60			.33943		.40163		
	8.60 8.55	.23091 .22429		.32355				
D	8.66	.23885	9.45	.34340			10.42	
AVERAGE		.23124		.33083		.40461		. 46317
S.D.		.00516		.01093		.00301		-01189
ENPERATU		0.501C 65 MM HG						
XYGEN CO	NCENTRA	TION OF		: 8.25 Average		8.30		

SAMPLE Position				TIME	(MIN.)			
		0.		5.		10.		15.
	DATA1	DATA2	DATA1	BATA2	DATA1	DATA2	DATA1	DATA2
A	8.87	.22681	8.97	.23996	9.08	.25442	9.17	.26625
В	8.90	.23076	8.96	.23865	9.05	.25048	9.15	.26363
C	8.82	.22024	8.96	.23865	9.03	.24785	9.12	.25968
I t	8.88	.22813	8.98	.24127	9.06	.25179	9.15	.26363
AVERAGE		.22648		.23963		.25114		.26330
S.D.		.00388		.00109		.00237		.00235
TENPERATU	RE : 2	0.2010						
PRESSURE	: 7	65 MM HG						
OXYGEN CO	NCENTRA	TION OF		: 8.50	8.70	8.70		
AIR SATU	RATED D	ISTILLED	WATER	AVERAGE	8.633			

SAMPLE POSITION		· · · · · · · · ·		TIME	(MIN.)			
.0211708	DATA1		DATA1	DATA2	DATA1			DATA2
A B C II	8.35	.19398	8.50 8.48 8.62	.22047 .21782 .23637 .22180	8.70 8.68 8.73	.24432 .25094	9.05 9.00	27347 29334 28672
AVERAGE S.D.		.19961 .00499		.22412		.24565		.28340 .00741
DXYGEN CO	: 7 DNCENTRA	65 MM HG TION OF	WATER	: 8.23 Average	8.30 8.260	8.25		
				CONTENT OF				
III-60 	DIMENS	IONLESS P	OOL CONC	ENTRATION(DATA2)	FOR RUN 4		
III-60 SANPLE	DIMENS	IONLESS F	POOL CONC	ENTRATION() TINE 5. DATA2	DATA2) (HIN.) DATA1	FOR RUN 4 10. Data2	-C- 7205 	- 129-E
III-60 SAMPLE OSITION A B C	DIMENS	0. DATA2 .22681 .23076 .21761	DATA1 9.20 9.22 9.25	ENTRATION() TINE 5.	DATA2) (MIN.) DATA1 9.60 9.55 9.63	FOR RUN 4	DATA1 9.93 9.90 10.10	- 129-E
III-60 SAMPLE OSITION A B C	DIMENS	0. DATA2 .22681 .23076 .21761 .22418 .22484 .00479	DATA1 9.20 9.22 9.25 9.25	ENTRATION() TINE 5. DATA2 .27020 .27283 .27677	DATA2) (NIN.) DATA1 9.60 9.55 9.63 9.63 9.65	FOR RUN 4	-C- 7205 DATA1 9.93 9.90 10.10 9.90	- 129-E

.

SANFLE Position				TINE	CHIN.)		
	BATAI	0. DATA2	DATA1	5. DATA2	DATAI	DATA2		DATA
A	8.82	.21695		.29370		.35987		.39957
	8.80	.21430	9.59	.31885	9:92	.36252	10.40	.42604
	8.76	.20901	9.50	.30694	9.89	.35855	10.42	.42869
Ţ	8.90	.22753	9.55	.31355	10.00	.37311	10.55	.44589
		.21695		.30826		.36351		.42505
S.D.	· .	.00675		.00940		.00572		.01657
EMPERATI								
		65 MN HG						
DXYGEN CI	ONCENTRA	TION OF		: 8.73	8.70	8.60		
				AVERAGE		7		
			· · · · · · · · · · · · · · · · · · ·					
				<u>4</u>		*		
							•	
AB: E	ИГАСИР	ENENTS OF	ONVOEN		10. 1 . 1.1 1 .			
ABLE	NEASUR Titmens	EMENTS OF	OXYGEN	CONTENT OF	DILUTE DATA2)	D SAMPLES	(DATA1,P	PM) AND - 199-10
ABLE II-62	NEASUR Dimens	EMENTS OF Ionless P	OXYGEN Yool Conc	CONTENT OF Entration(DILUTE DATA2)	FOR RUN 4-	-C- 8698	- 188-Đ
AMPLE	NEASUR I'IMENS	EMENTS OF Ionless P	'OOL CONC	CONTENT OF ENTRATION(TIME	DATA2) 	FOR RUN 4-	-C- 8698	- 188-B
11-62 AMPLE	UIMENS	IONLESS P	'OOL CONC 	ENTRATION(TIME	DATA2) (HIN.)	FOR RUN 4-	-C- 8698 	- 188-B
11-62 	UIMENS	IONLESS P	'OOL CONC	ENTRATION(TIME 5.	DATA2) (MIN.)	FOR RUN 4-	-C- 8698	- 188-D
AMPLE OSITION	DIMENS	O. DATA2	OOL CONC	ENTRATION(TIME 5. DATA2	DATA2) (NIN.) DATA1	FOR RUN 4-	-C- 8698	- 188-8 15. DATA2
AMPLE OSITION	DIMENS	O. DATA2	OOL CONC	ENTRATION(TIME 5. DATA2	DATA2) (NIN.) DATA1	FOR RUN 4-	-C- 8698	- 188-8 15. DATA2
AMPLE SAMPLE SITION	DATA1 8.79 8.80	0. DATA2 .21020 .21151	DATA1 9.70 9.60	ENTRATION(TIME 5. DATA2 .32906 .31600	DATA2) (HIN.) DATA1 10.20 10.25	FOR RUN 4-	DATA1 10.82 10.80	- 188-9 15. DATA2 .47536 .47274
AMPLE OSITION A B C	DATA1 8.79 8.80 8.85	0. DATA2 .21020 .21151 .21804	DATA1 9.70 9.55	ENTRATION(TIME 5. DATA2 .32906 .31600 .30947	DATA2) (HIN.) DATA1 10.20 10.25 10.25	FOR RUN 4-	UATA1 10.82 10.80 10.80	- 188-9 15. DATA2 .47536 .47274
AMPLE OSITION A B	DATA1 8.79 8.80	0. DATA2 .21020 .21151 .21804	DATA1 9.70 9.60	ENTRATION(TIME 5. DATA2 .32906 .31600 .30947	DATA2) (HIN.) DATA1 10.20 10.25	FOR RUN 4-	UATA1 10.82 10.80 10.80	- 188-9 15. DATA2 .47536 .47274
AMPLE OSITION A B C D AVERAGE	DATA1 BATA1 8.79 8.80 8.85 8.85 8.85	0. DATA2 .21020 .21151 .21804	DATA1 9.70 9.55	ENTRATION(TIME 5. DATA2 .32906 .31600 .30947	DATA2) (HIN.) DATA1 10.20 10.25 10.25	FOR RUN 4-	UATA1 10.82 10.80 10.80	- 188-9 15. DATA2 .47536 .47274 .47274 .48581
AMPLE OSITION A B C D	DATA1 BATA1 8.79 8.80 8.85 8.85 8.85	0. DATA2 .21020 .21151 .21804 .21804	DATA1 9.70 9.55	ENTRATION(TIME 5. DATA2 .32906 .31600 .30947 .33951	DATA2) (HIN.) DATA1 10.20 10.25 10.25	FOR RUN 4-	UATA1 10.82 10.80 10.80 10.90	- 188-9 15. DATA2 .47536 .47274 .47274
AMPLE OSITION A B C D AVERAGE S.D.	DATA1 B.79 8.80 8.85 8.85 8.85	0. DATA2 .21020 .21151 .21804 .21804 .21445 .00362	DATA1 9.70 9.55	ENTRATION(TIME 5. DATA2 .32906 .31600 .30947 .33951 .32351	DATA2) (HIN.) DATA1 10.20 10.25 10.25	FOR RUN 4-	UATA1 10.82 10.80 10.80 10.90	- 188-9 15. DATA2 .47536 .47274 .47274 .48581 .47666
AMPLE OSITION A A B C D AVERAGE S.D. EMPERATU	DATA1 B.79 8.80 8.85 8.85 8.85	O. DATA2 .21020 .21151 .21804 .21804 .21445 .00362 9.90'C	DATA1 9.70 9.55	ENTRATION(TIME 5. DATA2 .32906 .31600 .30947 .33951 .32351	DATA2) (HIN.) DATA1 10.20 10.25 10.25	FOR RUN 4-	UATA1 10.82 10.80 10.80 10.90	- 188-9 15. DATA2 .47536 .47274 .47274 .48581 .47666
AMPLE OSITION A A B C D AVERAGE S.D. EMPERATU RESSURE XYGEN CO	DATA1 BATA1 8.79 8.80 8.85 8.85 8.85 9.85 9.85	O. DATA2 .21020 .21151 .21804 .21804 .21845 .00362 9.90'C 65 MM HG	DATA1 9.70 9.60 9.55 9.78	ENTRATION(TIME 5. DATA2 .32906 .31600 .30947 .33951 .32351	DATA2) (HIN.) DATA1 10.20 10.25 10.25 10.38	FOR RUN 4- 10. DATA2 .39437 .40090 .40090 .41788 .40352 .00871	UATA1 10.82 10.80 10.80 10.90	- 188-9 15. DATA2 .47536 .47274 .47274 .48581 .47666

TABLEMEASUREMENTS OF OXYGEN CONTENT OF DILUTED SAMPLES(DATA1, PPM) ANDIII-61DIMENSIONLESS POOL CONCENTRATION(DATA2) FOR RUN 4-C- 8200- 167-B

Table III-63. Values of TFS for one nozzle

Run Number	TFS (m1/min.)	95% Confidence Limits	Correlation Coefficient
1-5324-71-S	23.3	+ 1.2%	.951
1-8908-198-S	33.0	+ 7.9%	.971
1-13687-466-S	41.4	+10.3%	.952
1-21044-1103-S	47.3	+ 9.0%	.963
1-24837-1536-S	58.0	+ 7.1%	.978
1-28819-2068-S	64.2	+ 7.7%	.973

Table III-64. Values of TFS for two nozzles

Run Number	TFS (ml/min.)	95% Confidence Limits	Correlation Coefficient
2-0-5251-69-S	23.8	+ 9.0%	.964
2-0-7640-145-S	32.5	+ 9.3%	.961
2-0-12419-384-S	42.7	+10.0%	.954
2-0-14410-517-S	46.2	+10.4%	.960
2-0-16401-670-S	52.2	+ 4.5%	.991

Table III-65. Values of TFS for four nozzles

Run Number	TFS (ml/min.)	95% Confidence Limits	Correlation Coefficient
4-0-5214-68-S	30.4	+ 7.9%	.972
4-0-6209-96-S	33.9	+ 9.4%	.963
4-0-7205-129-S	43.2	+ 7.6%	.974
4-0-8200-167-S	47.0	+ 7.0%	.979
4-0-8698-188-S	53.2	+ 8.2%	.967

Table III-66. Values of TTF for one nozzle

Run number	TTF (ml/min.)	95% Confidence Limits	Correlation Coefficient
1-5324-71-B	142.0	+ 12.1%	.952
1-8908-198-B	343.7	+ 6.4%	.981
1-13687-466-В	883.4	$\frac{-}{+}$ 7.1%	.979
1-21044-1103-в	2061.4	+ 4.6%	.990
1-24837-1536-в	2270.9	+ 7.9%	.973
1-28819-2068-В	2801.8	$\frac{1}{4}$ 9.0%	.966

Table III-67. Values of TTF for two nozzle at position O

Run number	TTF (m1/min.)	95% Confidence Limits	Correlation Coefficient
2-0-5251-69-B	132.1	+ 11.3%	.944
2-0-7640-145-B	388.0	+ 4.8%	.989
2-0-12419-384-B	1281.5	$\frac{1}{4}$ 2.1%	.998
2-0-14410-517-B	1588.6	+ 3.7%	.994
2-0-16401-670-В	2158.8	$\frac{-}{+}$ 4.4%	.991

Table III-68. Values of TTF for two nozzle at position A

Run number	TTF (ml/min.)	95% Confidence Limits	Correlation Coefficient
2-A-5251-69-B	144.1	+ 6.1%	.983
2-A-7640-145-B	369.1	$\frac{1}{4}$ 4.7%	.991
2-A-12419-384-B	1328.1	+ 4.7%	.992
2-А-14410-517-В 2-А-16401-670-В	1743.1 2292.0	$\frac{+}{+}$ 4.7% $\frac{+}{2.6\%}$.990 .997

Run number	TTF (ml/min.)	95% Confidence Limits	Correlation Coefficient
2-В-5251-69-В	125.6	+ 9.1%	.972
2-B-7640-145-B	366.4	+ 7.4%	.982
2-B-12419-384-B	1291.8	+ 4.2%	.992
2-B-14410-517-B	1780.5	+ 3.6%	.994
2-в-16401-670-в	2360.8	+ 4.1%	.992

Table III-69. Values of TTF for two nozzles at Position B

Table III-70. Values of TTF for two nozzles at position C

Run number	TTF (ml/min.)	95% Confidence Limits	Correlation Coefficient
2-С-5251-69-В	135.0	+ 5.3%	.988
2-C-7640-145-B	398.5	+ 6.4%	.983
2-C-12419-384-B	1377.1	+ 4.6%	.990
2-С-14410-517-В	1802.3	+ 3.7%	.994
2-С-16401-670-В	2462.6	$\frac{1}{4}$ 2.7%	.997

Table III-71. Values of TTF for four nozzles at position O

Run number	TTF (ml/min.)	95% Confidence Limits	Correlation Coefficient
 4-0-5214-68-в	129.8	+ 9.5%	.968
4-0-6209-96-B	226.9	+ 8.9%	.968
4-0-7205-129-B	536.4	+ 5.9%	.984
4-0-8200-167-в	816.6	+ 6.1%	.986
4-0-8698-188-в	898.9	+ 5.5%	.989

Table III-72. Values of TTF for four nozzles at position A.

Run number	TTF (ml/min.)	95% Confidence Limits	Correlation Coefficient
4-A-5214-68-B	132.6	+ 8.4%	.975
4-A-6209-96-B	247.0	+ 8.3%	.973
4-А-7205-129-В	459.1	+ 9.0%	.964
4-А-8200-167-В	838.5	+ 7.7%	.973
4-А-8698-188-в	1008.8	+ 4.7%	.990

Table III-73. Values of TTF for four nozzles at position B.

Run number	TTF (ml/min.)	95% Confidence Limits	Correlation Coefficient
4-B-5214-68-B	139.9	+ 14.8%	.919
4-в-6209-96-в	298.7	+ 6.6%	.980
4-в-7205-129-в	531.6	+ 4.1%	.993
4-в-8200-167-в	940.4	+ 5.1%	.988
4-в-8698-188-в	1129.2	+ 4.2%	.992

Table III-74. Values of TTF for four nozzles at position C.

Run number	TTF (m1/min.)	95% Confidence Limits	Correlation Coefficient
4-C-5214-68-B	149.1	+ 6.3%	.982
4-C-6209-96-B	314.7	+ 8.7%	.971
4-C-7205-129-B	705.7	+ 4.4%	.991
4-С-8200-167-В	958.4	+ 5.6%	.986
4-C-8698-188-B	1254.1	+ 3.1%	.996

Table III-75. Calculated values of TF for one nozzle

Run number	TF (m1/min.)	Deviation of TF values
1-5324-71 1-8908-198 1-13687-466 1-21044-1103 1-24837-1536 1-28819-2068	118.7 310.7 842.0 2014.1 2212.9 2737.6	$\begin{array}{r} + 20.0 & (16.9\%) \\ + 24.7 & (7.9\%) \\ + 67.0 & (8.0\%) \\ + 99.4 & (4.9\%) \\ + 183.2 & (8.3\%) \\ + 257.6 & (9.4\%) \end{array}$

Table III-76. Calculated values of TF for two nozzles at position O

Run number	TF (m1/min.)	Deviation of TF values
2-0-5251-69	100 0	
	108.3	$\pm 17.1 (15.7\%)$
2-0-7640-145	355.5	+ 21.6 (6.1%)
2-0-12419-384	1238.8	+30.6(2.5%)
2-0-14410-517	1542.4	+ 63.4 (4.1%)
2-0-16401-670	2106.6	+ 97.5 (4.6%)

Table III-77. Calculated values of TF for two nozzles at position A

Run number	TF (ml/min.)	Deviation of TF values
2-A-5251-69 2-A-7640-145 2-A-12419-384 2-A-14410-517 2-A-16401-670	120.3 336.6 1285.4 1696.9 2239.8	$\begin{array}{r} + 10.9 & (9.1\%) \\ + 20.4 & (6.1\%) \\ + 67.2 & (5.2\%) \\ + 87.1 & (5.1\%) \\ + 62.9 & (2.8\%) \end{array}$

TF (ml/min.)	Deviation of TF values
101.8	<u>+</u> 13.5 (13.3%)
333.9	\pm 30.2 (9.1%)
	$\frac{+}{1}$ 58.3 (4.7%)
2308.6	± 68.3 (3.9%) ± 100.1 (4.3%)
	(m1/min.) 101.8 333.9 1249.1 1734.3

Table III-78. Calculated values of TF for two nozzles at position B

Table III-79. Calculated values of TF for two nozzles at position C

Deviation of TF values
- 9.4 (8.4%)
- 28.5 (7.8%)
- 67.9 (5.1%)
- 71.2 (4.1%)
69.4 (2.9%)

Table III-80. Calculated values of TF for four nozzles at position O

Run number	TF (ml/min.)	Deviation of TF values
4-0-5214-68	99.4	+ 14.7 (14.8%)
4-0-6209-96	193.0	+ 23.4 (12.1%)
4-0-7205-129	493.2	+34.9 (7.1%)
4-0-8200-167	769.6	+ 53.0 (6.9%)
4-0-8698-188	845.7	+ 53.4 (6.3%)

Run number	TF (m1/min.)	Deviation of TF values
4-A-5214-68	102.2	+ 13.5 (13.2%)
4-A-6209-96	213.1	+ 23.7 (11.1%)
4-A-7205-129	415.9	+ 44.7 (10.8%)
4-A-8200-167	791.5	+ 67.8 (8.6%)
4-A-8698-188	955.6	+ 52.1 (5.5%)

Table III-81. Calculated values of TF for four nozzles at position A

Table III-82. Calculated values of TF for four nozzles at position B

Run number	TF (ml/min.)	Deviation of TF values
4-B-5214-68	109.5	+ 23.1 (21.1%)
4-B-6209-96	264.8	+22.9 (8.6%)
4-B-7205-129	488.4	+ 24.9 (5.1%)
4-B-8200-167	893.4	+ 50.8 (5.7%)
4-B-8698-188	1076.0	+ 51.5 (4.8%)

Table III-83. Calculated values of TF for four nozzles at position C

Run number	TF (ml/min.)	Deviation of TF values
4-C-5214-68	118.7	+ 11.7 (9.9%)
4-C-6209-96	280.8	$\overline{+}$ 30.6 (10.9%)
4-C-7205-129	662.5	+ 30.9 (4.7%)
4-C-8200-167	911.4	+ 56.5 (6.2%)
4-C-8698-188	1200.9	+ 43.0 (3.6%)

APPENDIX IV

SAMPLE CALCULATION

Run 1-8908-198-B and 1-8908-198-S in Table III-3 and III-4 of Appendix III were used to illustrate the way of calculating values of TTF and TFS respectively.

16 samples in each table, which were taken at four different sample positions and at four different times with same time interval were analyzed with the average value of air saturated distilled water for each run.

If the oxygen concentration of a sample has a function of time and position, i.e. C (time, position), then the demonstrating oxygen concentration in Table III-3 is

$$C(15, B) = 9.40$$

Since this oxygen concentration is measured in the diluted state, the actual concentration must be calculated using a simple mass balance equation.

Actual Concentration = [(^{Diluted sample}_{Concentration}) x (^{Diluted sample}_{volume}) - (^{Air saturated water}_{concentration}) x (^{Air saturated}_{water volume})]/

(Pool sample volume)

where,

Diluted sample volume	=	290	ml
Air saturated water volume	=	240	ml
Pool sample volume	=	50	m1

then

$$C_{Actual}(15,B) = \frac{9.4 \times 290 - 8.6 \times 240}{50} = 13.24 \text{ (ppm)}$$

The solubility of oxygen exposed to air saturated water at 760 mmHg, 20.55°C was found to be 9.09 by interpolation from Table II-7 of Appendix II. The actual solubility corresponding to the experimental condition is

> Actual Solubility = 9.09 (ppm) x $\frac{765 \text{ mmHg}}{760 \text{ mmHg}}$ x $\frac{99.999\% \text{ pure } 02}{20.9\% 02}$ in Air = 43.77852 (ppm)

Then the dimensionless pool concentration C^+ is obtained by dividing actual concentration by actual solubility

$$C^+(15, B) = \frac{13.24}{43.77852} = 0.30243$$

 C_{\circ}^{+} , the average value of C^{+} at time = 0, is one quater of the summation of all C^{+} at time = 0, which were computed in the previous way. In this case,

$$C_{\circ}^{+} = 0.21234$$

then

$$\ln\left(\frac{1-C_{o}^{+}}{1-C^{+}}\right) = \ln\left(\frac{1-0.21234}{1-0.30243}\right) = 0.12146$$

The value, $\ln(\frac{1-c_o^+}{1-c^+})$ of the other samples are a function of time. To obtain the slope of this function, the data were analyzed by a linear regression method. In this work, subroutine RLONE in IMSL (International Mathematical and Statistical Library), which is based on the theory in the book, Applied Regression Analysis⁽²⁾, was used. The slope, $\frac{\text{TTF}}{\text{V}}$ turned out to be

$$\frac{\text{TTF}}{\text{V}}$$
 = .00751408

and

TTF =
$$(.00751408) \cdot V = (.00751408) \cdot (45743.7)$$

= 343.7218 (m1/min.)

Upper confidence limit of $\frac{\text{TTF}}{\text{V}}$ = .00799714 Lower confidence limit of $\frac{\text{TTF}}{\text{V}}$ = .00703102

Then,

TTF =
$$343.7218 + 22.0970 \text{ (ml/min.)}$$

= $343.7218 + 6.43\% \text{ (ml/min.)}$

or

TFS was calculated in the same way

or =
$$32.9852 \pm 7.88\%$$
 (m1/min.)
= $32.9852 \pm 7.88\%$ (m1/min.)

Therefore, the calculated TF was

$$TF = TTF - TFS$$

and

Then

Upper	C.L.	of	ΤF	=	Upper C.L. _{TTF} - Lower C.L. _{TFS}
Lower	C.L.	of	ΤF	=	Lower C.L. _{TTF} - Upper C.L. _{TFS}
			TF	=	343.7218 - 32.9852
				=	310.7366 (ml/min.)
Upper	C.L.	of	TF	=	22.0970 - (-2.5993)
				=	24.6963
Lower	C.L.	of	TF	=	-22.0970 - 2.5993
				= -	-24.6963

Therefore,

or

TF	=	310.7366 <u>+</u>	24.6963	(ml/min.)
	=	310.7366 <u>+</u>	7.95%	(ml/min.)

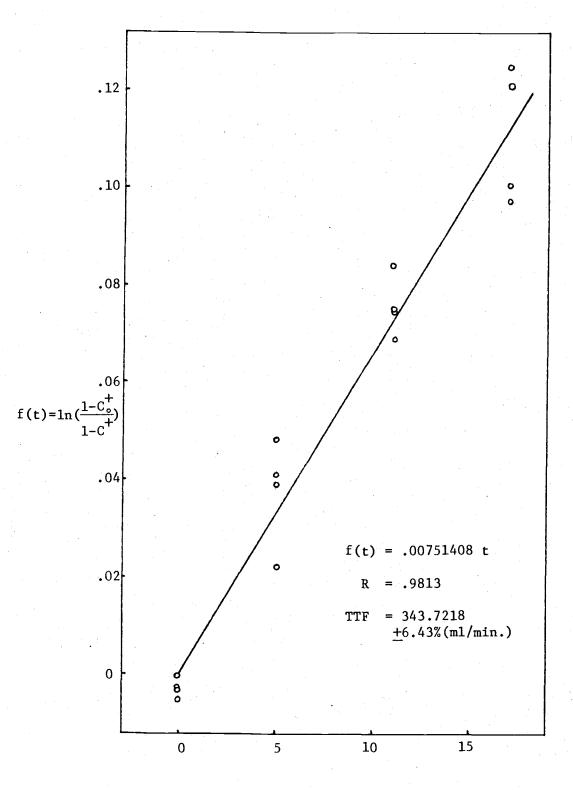


Fig.VIII-1. Determination of TTF

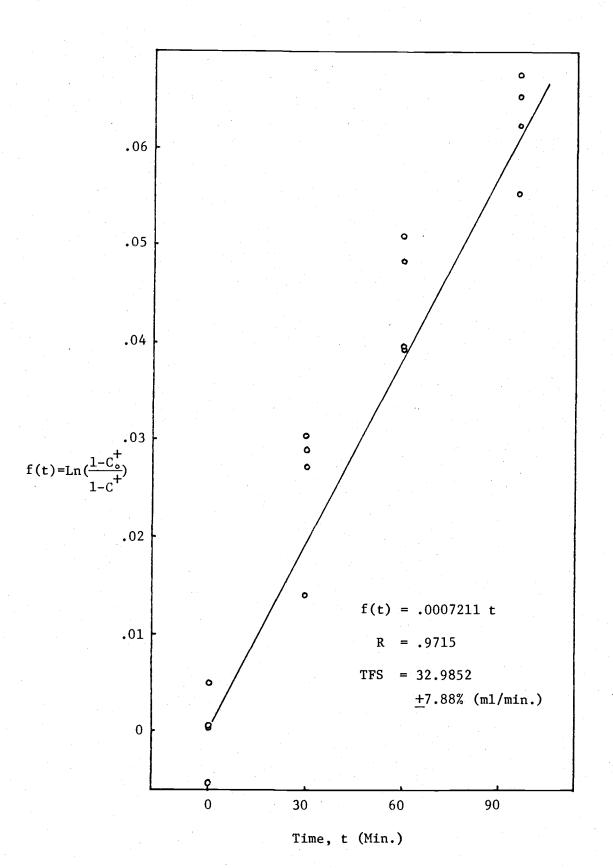


Fig.VIII-2. Determination of TFS

APPENDIX V

NONMENCLATURE

Symbol	Sifnificance
A	Interfacial area
C	Concentration of oxygen in water
C.L.	95% Confidence Limits
D	Diameter of jet
g _c	Newton's law conversion factor
h	Pool depth
K	Overall mass transfer coefficient
k generation of the second	Mass transfer coefficient
L	Length of nozzle
N _{Re}	Reynolds number of jet $(D_J V_J \rho / \mu)$
N _{We}	Weber number of jet ($D_J V_J^2 \rho / \sigma g_c$)
n	The number of jets
Q	Volumetric flow rate
R	Linear correlation coefficient
r	Rate of oxygen absorption
S.D.	Standard deviation
t	Time
TF	Transfer factor
TFS	Surface transfer factor
TTF	Total transfer factor

Symbol		Significance
V	· · · · · · · · · · · · · · · · · · ·	Pool volume
v		Velocity of jet stream
Greek		

μ.	Viscosity
ρ	Density
σ	Surface tension

Subscript	
В	Bubble
Ε	Exit Stream
J	Jet
L	Liquid
0	Initial condition
S	Surface

Superscript

*

+

Equilibrium value
Dimensionless value