

INTEROFFICE COMMUNICATION

Ponca City, Oklahoma
July 24, 1970

TO: Mr. J. D. Minott, Westlake, Louisiana

SUBJECT: APRIL TURNAROUND CATALYST SAMPLES SUMMARY

This is a summary of our activities and conclusions related to the catalyst samples analyzed from the April turnaround.

1. The balanced operation that resulted in more reaction in R303 with lower temperatures in R301 was a major process improvement. The primary mechanism of catalyst deactivation during this campaign was copper chloride migration; whereas during the previous campaign, it was physical deterioration due to large coke centers.
2. Most of the prior analytical test analyses have been repeated and extended and improved for this series of samples.
3. We have developed an experimental technique to measure catalyst activity.
4. Experimental catalyst activities were determined for the samples and are included in the attached curve. It can be seen that catalysts that are twice as active as new catalysts exist in parts of the reactors.
5. A detailed theoretical analysis of mass and heat transfer effects within an oxychlorination pellet has been made. Comparisons have been made with results on experimental activity.
6. Based on an analysis with SIMOXY and a recent report on capacity increase, it may be possible to get as much as 25% increase in capacity in the present system if the catalyst activity can be maintained at its initial value. Eight small-scale pilot runs have been made on a method to reactivate catalyst in the system. The results are inconclusive at this time.
7. Some preliminary data on the EDC cracking furnace carbons has been obtained.
8. Analysis of EDC from oxy for butadiene was negative.
9. Mercury has been found repeatedly on the spent catalyst increasing in amount from R303 > R302 > R301. You may want to give attention to this fact as a safety precaution at turnaround.

CCR 000008262

Mr. J. D. Minott
July 24, 1970
Page 2

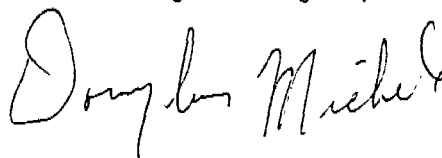
Details of these items and further findings will be contained
in our report.



F. J. Radd
Senior Research Associate
Central Research Division



M. C. Hawley
Engineering Consultant
Process Engineering Department

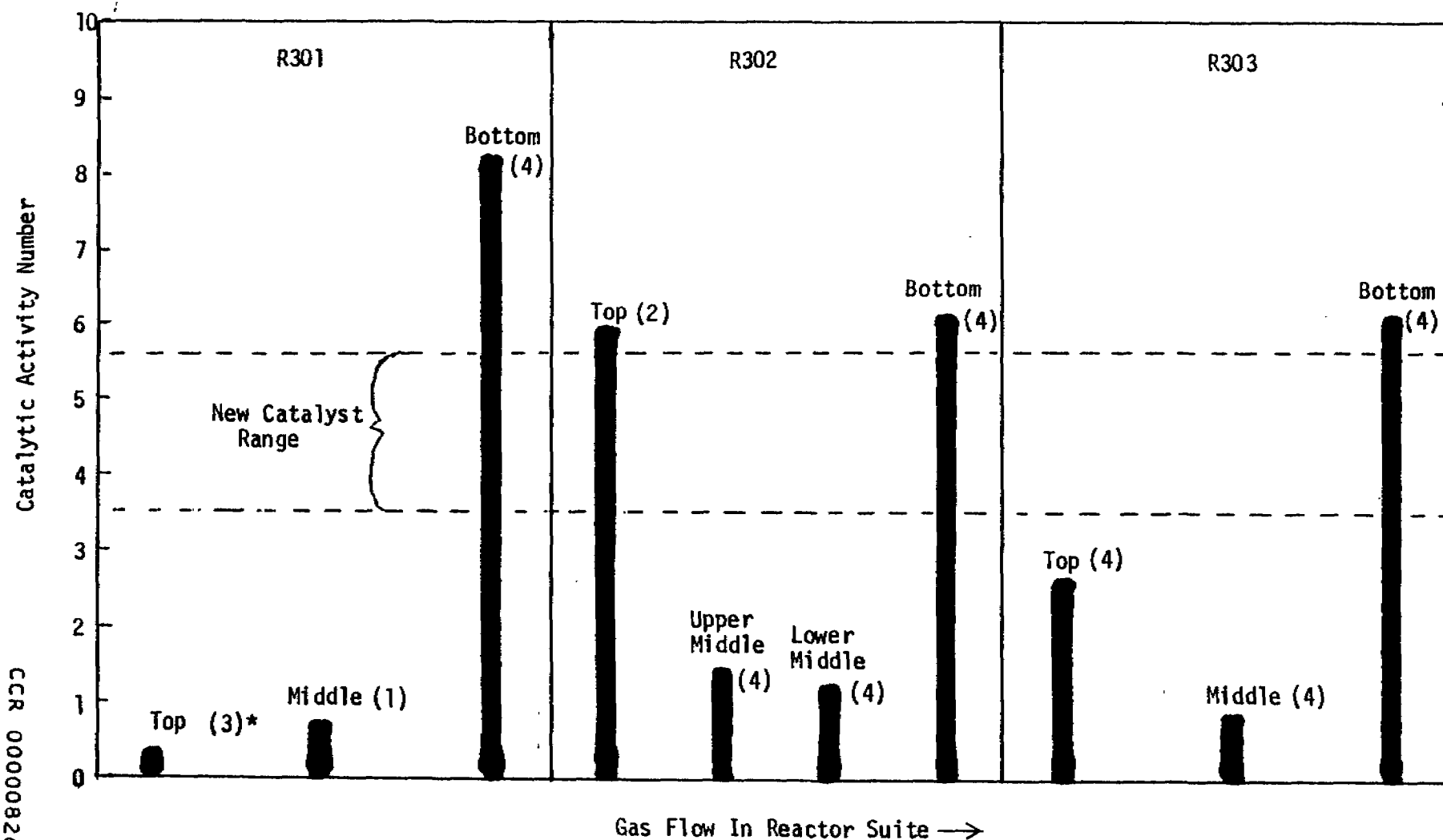


D. E. Michels
Chemical Engineer
Petrochemical Division
Process Engineering Department

FJR-MCH-DEM/NP
Attachment
CC: HDB-FK-CVF-LNV-GJF-RHG
DG-PF

CCR 000008263

SCANA PROFILE OF OXY SUITE
(April 13, 1970 Shutdown) (Harshaw Catalyst)



(3)* - This enclosed number corresponds to number of experimental measurements.

CCR 000008264

4/24/70

Doug Michaels
Martin Koley
Eric Cresswell

OXYCHLORINATION DEBOTTLENECKING

1. Statement of program accuracy with respect to rate changes. Would like operating conditions at two different rates at full catalyst activity.

2. Conversions possible in present system at 150% of rate and with present catalyst loadings. Full catalyst activity. What would be hot spot temperatures and steam drum pressures. Pressure drop limitations in system.

3. Changed catalyst loading patterns for more catalyst. What effect on conversions at 150%?

1150 MM (lb/y) - 90% on stream
56,090 #/hr. HLL

low priority

4. → Smaller catalyst for larger surface area. Delta P limitations and effect on conversion at high rates.

5. Higher inlet pressure to system for higher reaction rate. Plant Limit 100 psig

6. Possible fourth reactor in series. What catalyst loadings and air split, etc. SP problems.

7. Given a defined catalyst deactivation (such as at shutdown April 1970) determine conversion in oxy that is possible with appropriate operating conditions.

8. Possible series and parallel arrangements of three and four reactor systems.

9. Possibility of condensing ethylene and recycling to R-301. Expensive

10. Possible oxygen in feed with a diluent such as nitrogen, air or EDC. PP6 patient

11. Possible splitting of ethylene and HCl to the reactors. stuff HCL splits

12. Use of R-304 as an oxy reactor. cancel.

13. Use of R-304 as now but to get more reaction with less ethylene conversion in oxy and additional direct chlorination in R-304.

14. Best estimate statement of catalyst life by considering conc. and temp. profiles and total throughput.

- CONTINENTAL VCM PLANT
Location WESTLAKE, LA. Date Feb 12 1971

Received from CONTINENTAL OIL COMPANY the sum of,

Four and 50/100 dollars \$ 4 50

in payment of: Postage - Ship Ceramic Pellets

(John Minatt)
Wendell E. Kroschke
R + D. Oxy. Systems
1290 South 47th St
Richmond, Calif. 94804

If expense on company car or truck

Signed LA eris

show number here CCR 000008266

By _____



CCR 000008267

WENDELL E. KNOSHAUG
(K+O - oxy systems)

RESEARCH ENGINEER
WESTERN RESEARCH CENTER
STAUFFER CHEMICAL COMPANY

1200 SOUTH 47TH STREET
RICHMOND, CALIF. 94804
(415) 233-9361

from

J. D. MINOTT

19

To

all Wendell on location of spread
tubes (any problems, ect.).

1 profile / month with cover sheet for life of
past cataloged to WRC.

Joe Smith - WRC - Analytical Dept.

CCR 000008268

SUBJECT

Special Catalyst Loading for S. R. C.

DATE

4/29/70

1-61X3

TO

Wendell E. Knoshaug
W.R.C. Stauffer Chemical Co.
Richmond, California

FROM

Conoco-VCM Plant

Dept. ☒ Process Engineering

MEMO

Enclosed are 2 copies of the location of your special "high strength" catalyst in the 3 oxy reactors. All 3 tubes are in the same relative location in each reactor. No special problems were encountered during metallation or Tactup. We presently are operating slightly above design rates (for 2 days now) with Hot spots of 245°C, 245°C, and 275°C on R-301, 302, + 303 respectively. SIGNED J. D. Minott

REPLY

The oxy profiles for the previous charge of catalyst should already be in Bob Olbrecht's possession. If you are missing any, please let me know.

CCR 000008269

SIGNED

FILE AND FOLLOW-UP COPY

SUBJECT

Special Catalyst Loading for 3 R.C.

DATE

4/29/70

1-51X3

FROM

Wendell E. Brewster
W.R.C. Buffer, Inc.
Richmond, California

TO

C. & VCM Plant

Dept. → Process Engineering

MEMO

Enclosed are 2 copies of the location of your special high strength catalyst for the 3 oxy reactors. All 3 tubes are in the same relative location in each reactor. No special problems were encountered during installation or startup. We presently are operating slightly above design rates (for 2 days now) with hot spots of 245°C, 245°C, and 275°C in R 301, 302, + 303 respectively. SIGNED J. D. Minott

REPLY

The oxy purifiers for the previous change of catalyst should already be in Bob Olbeck's possession. If you are missing any, please let me know.

CCR 000008270

SIGNED

RETURN THIS COPY TO SENDER

Finto

DR. T. J. OFFICE OF THE DIRECTOR, U. S. DEPARTMENT OF COMMERCE, BUREAU OF STANDARDS, WASHINGTON, D. C. 20535

To: Engineering Department

Date: February 11, 1966

Attention on: Mr. R. C. Holt

From: A. L. deVries

Copy to: Messrs:
L. J. Hoy
A. P. McGuire
D. H. Roberts
F. G. Michels
S. H. Friedman
R. P. Obrecht
G. E. Klingman
H. K. Lutz (W. B. Strobel)
L. W. Vickery
J. H. Smith
H. D. Butter
R. A. Campbell

Subject: A.F. 14-009
VCM Continental - Stauffer
Project
Lake Charles, Louisiana
Oxychlorination Reactor
Tubes

Wall thickness of nickel tubes for the Lake Charles Oxychlorination Reactors R-301, R-302, R-303 have been set at 11 gage average wall. Tubes for R-304 will be 12 gage average wall. Design pressure and temperature for R-304 unit is less than for others.

American Chemical tubes have been 10 gage average wall with a experience of no corrosion. We had originally planned to go to 12 gage minimum wall but find that 11 gage average wall is less expensive than the 12 gage minimum wall.

RANGE FOR AVERAGE WALL

		<u>MINIMUM</u>	<u>MAXIMUM</u>
10 Gage	.134 inches	.121	.147
11 Gage	.120 inches	.108	.132
12 Gage	.109 inches	.098	.120

We have further changed from annealed to stress relieved nickel. Corrosion resistance not effected but abrasion resistance is enhanced, tube will be less soft.

As per recommendation of Research - we are holding the 12 foot overall tube length in Reactors R-301, 2, 3.

ALL ps

A. L. deVries
A. L. deVries

CCR 000008271

from

R. H. GERLACH

Aug 24, 1970

To

J D M → JCL

Debs has requested that we size a new steam control valve for R-304. The present valve can't handle it with the high Cl_2 rates.

Whoever sizes the valve should be sure to take into consideration the back pressure involved when this stream ties in to the low pressure condensate drum.

RHG

CCR 000008272

SUBJECT

R-304 TEAM CONTROL VALVE

DATE

23 AUG 70

1-51X3

FROM

DEBS GARDLIN
RICH GEFACH

TO

JCLUNN, JR

Dept. →

MEMO

EXISTING VALVE: FISHER SINGLE PORT DESIGN "A" BODY V-PUP VALVE PLUG

4" BODY 4" PORT $C_v \text{ MAX} = 270$

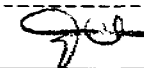
@ 16# DRUM PRESSURE - MAX FLOW: 13323 lbs/HR.

NEW VALVE: FISHER SINGLE PORT DESIGN "A" BODY V-PUP VALVE PLUG

6" BODY 6" PORT $C_v \text{ MAX} = 600$

@ 16# DRUM PRESSURE - MAX FLOW: 34056 lbs/HR.

SIGNED



DATE

REPLY

CCR 000008273

SIGNED

RETURN THIS COPY TO SENDER

$$v = \left[(2.1)(32.2) \left(\frac{1544}{18} \right) (685) \right]^{1/2} =$$

2000 ft/sec
(1995 ft/sec)

$$W = 2.1 C_v \sqrt{\frac{1}{\Delta P(P_1 + P_2)}}$$

4" Port area = 12.6

(0.0875 ft²)

$$W = 2.1 (C_v) \sqrt{\frac{1}{16(30.7 + 14.7)}}$$

(645.9 ft/sec)
U.S. Customary

$$W = 2.1 C_v \sqrt{0.001376}$$

$$W = \frac{2.1 C_v}{0.037} = 56.76 \times C_v$$

Single port Design 'A' Body V-PUP

4" Body / 4" Port 1 1/2" travel

C_v @ 100% 270

$$W = (2.1)(270)(6.73)4 = 15263.6 \text{ \#/hr}$$

6" V-PUP

CCR 000008274

CONTINENTAL OIL COMPANY
CALCULATION SHEET

JOE NELSON

TITLE

FIELD

STATE

from:

J. D. MINOTT

15, paig →

(5)

(8694) P. recal.

Dec. 17, 1970

To

Marlin Holley.

(8)

(30°F)

Samples

5401/101 after R-304 - -92°C - try for 100°C
gas phase before
gas into R-304 - Compositions -

H-305 yes

S-309 mly.

5055

48/34

(6-6°)

flow rate -

% C_2H_4 -

vent - C_2H_4

150°

Want Rates of moles C_2H_4 to Cl_2 →

1.35 C_2H_4
1 Cl_2

48/6"

Temp + Pressure in + out of R-304

111° - 131°
 $\Delta P = 3 \text{ psig}$ (3) (15)

①. S-306 + 307 - liquid samples. flow rates of
cand. - Routine Cl_2 check/shift streams.
Byproducts $\text{C}_2\text{H}_5\text{Cl}$ 112

②. TRC-307 setting -25°C

Why free Cl_2 limit in 0.1% in S-306

③.

(3)

75% 25%

(303)

300°C

Fred Hobbs

CCR 000008275

1.5%
650,000 ft³/hr STP at 1.5

640 lb/hr = 22.9 moles/hr.

50,000 #/hr.

55 tons/day Cl₂ × 2000 = 110,000 lb/day = $\frac{4583 \text{ lb/hr}}{71}$ = 64.6 moles/hr.

64.6 × 28 = 1808 lb/hr. C₂H₄ consumed.

75% of C₂H₄ consumed

6% C₂H₄ (1800)

64.6 moles/hr. reacted
22.9 moles/hr. vented
87.5 moles/hr. fed to R-304

Cl₂ feed = 64.6 moles/hr.

(220°)

$$\frac{64.6}{87.5} = \frac{1 \text{ Cl}_2}{1.35 \text{ C}_2\text{H}_4}$$

H=304-150°F 92°C - try for 110°C

S=309 C₂H₄ - 5.87%

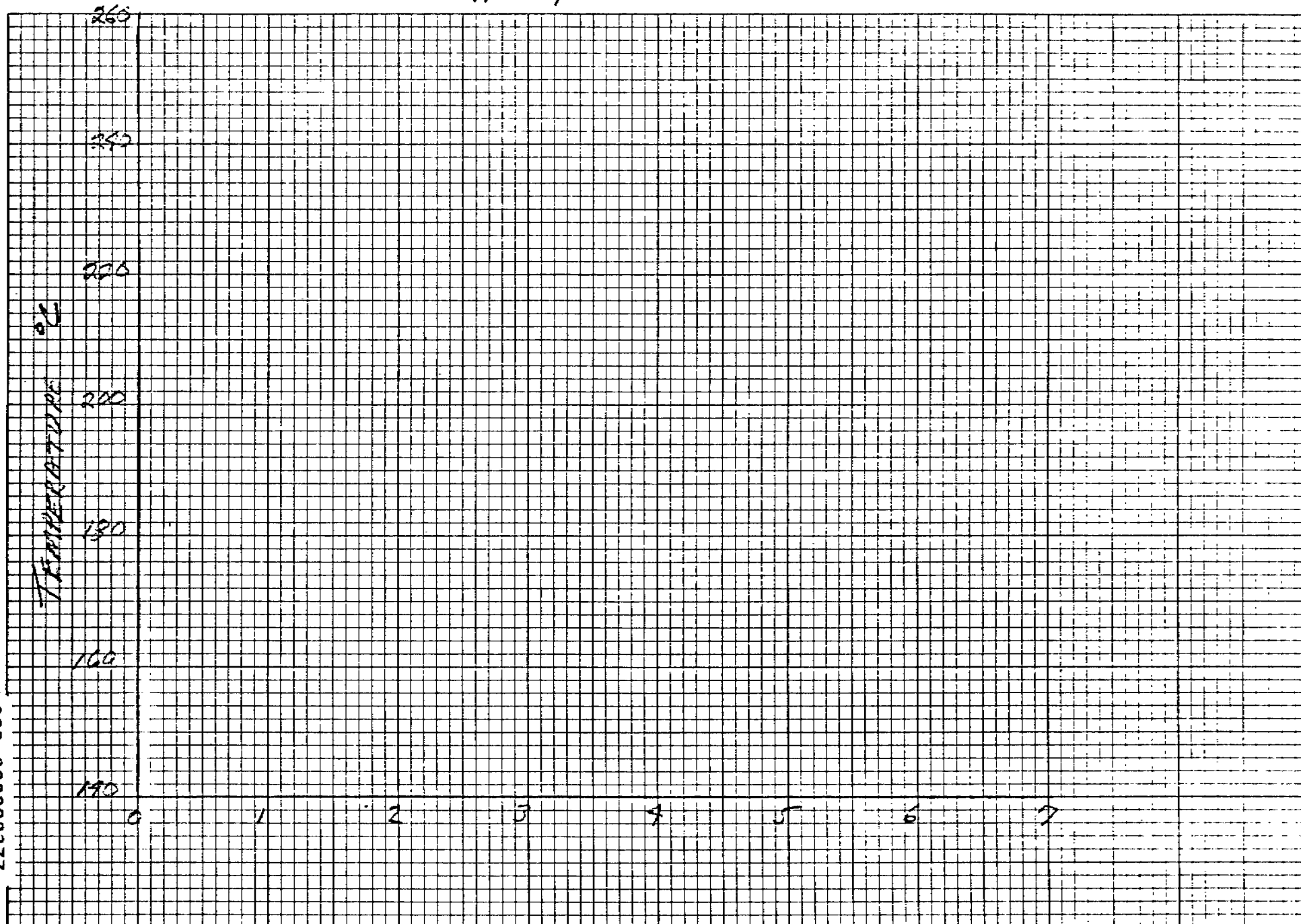
5.8%

5. 1.5%

Reactor pressure ratio - R-304

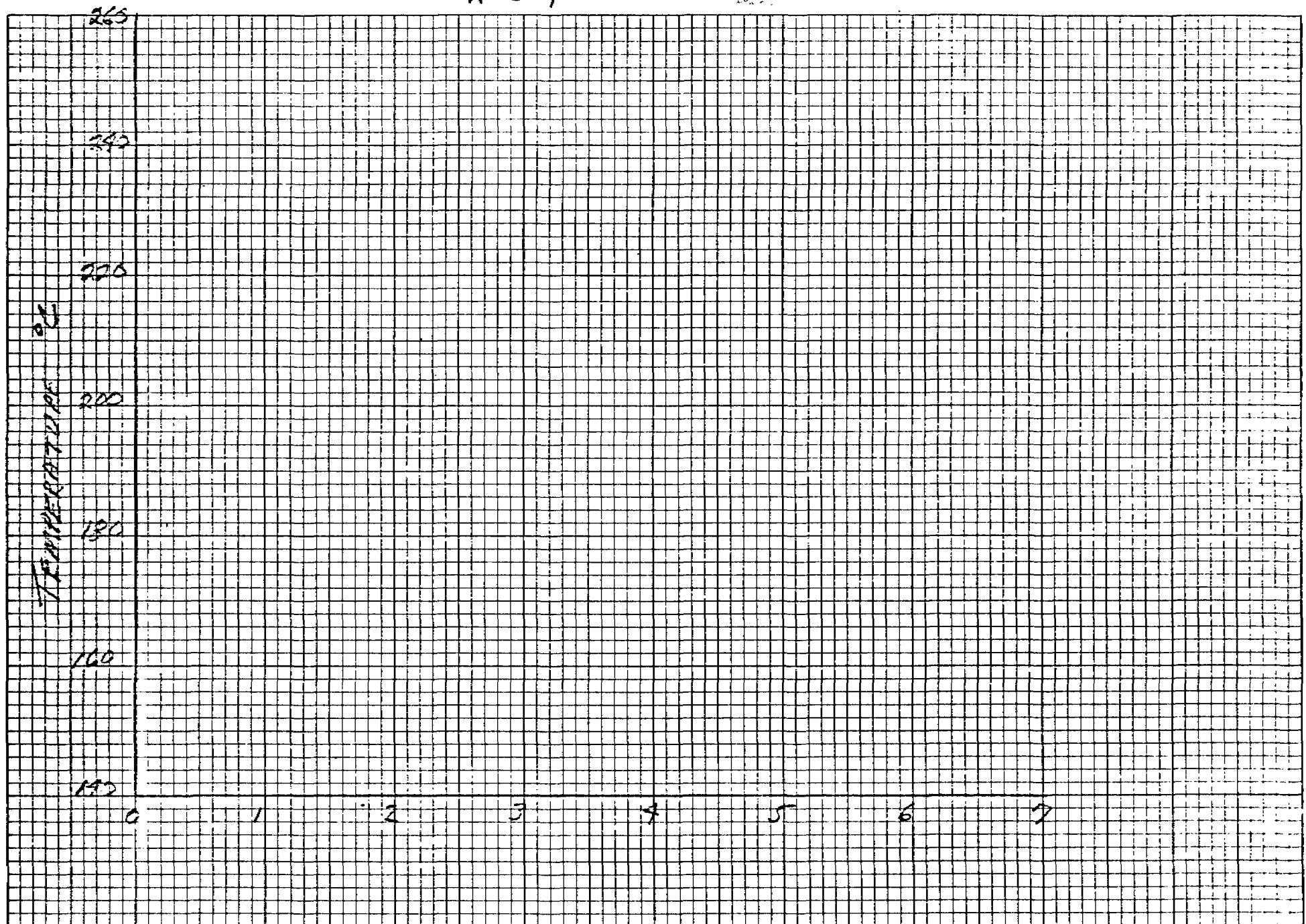
CCR 000008276

R-309

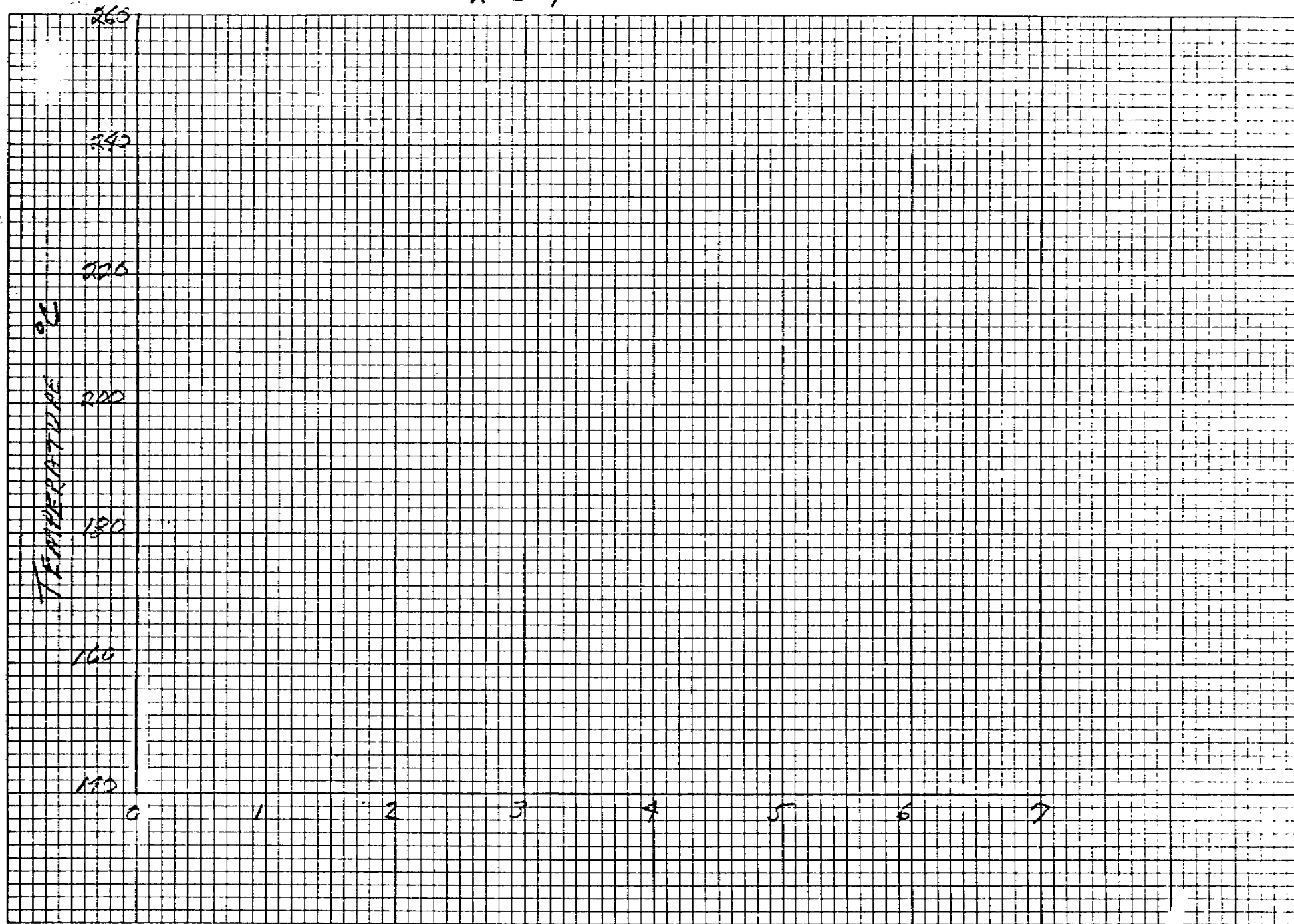


CCR 000008277

R-309

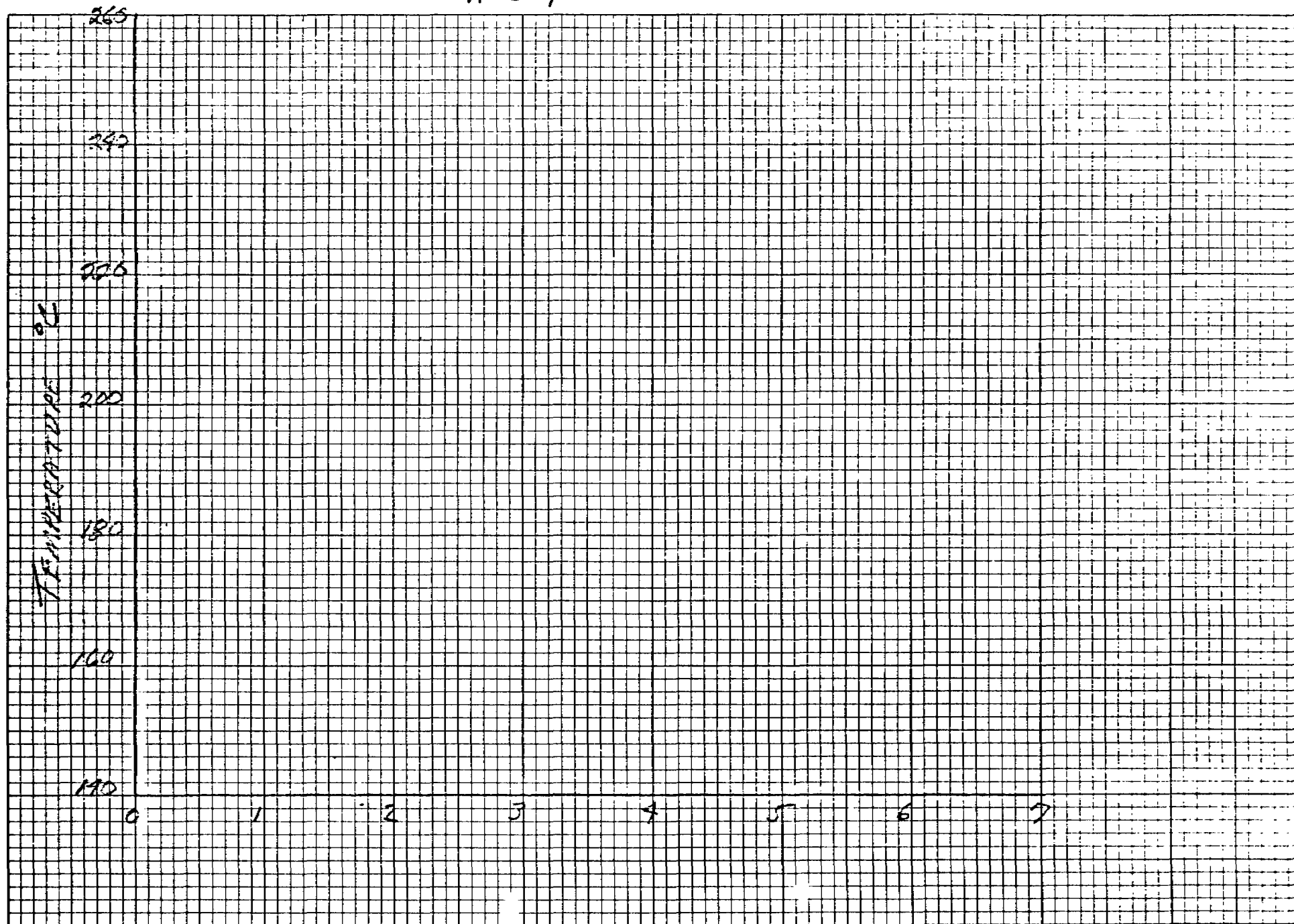


R-309

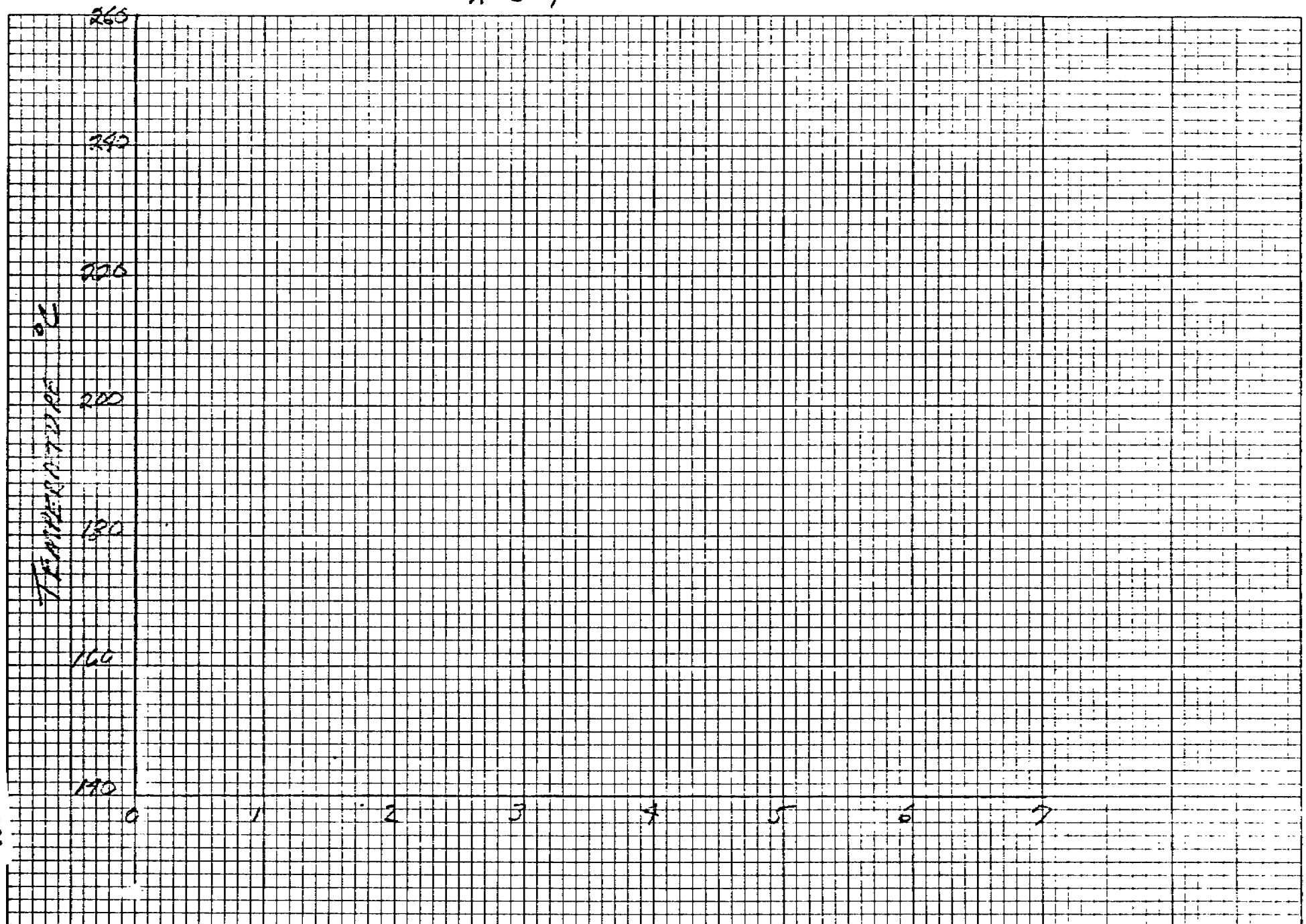


CCR 000008279

R-309



R-309



CCR 000008281

R-309

TEMPERATURE
°C

260
240
220
200
180
160
140

0

1

2

3

4

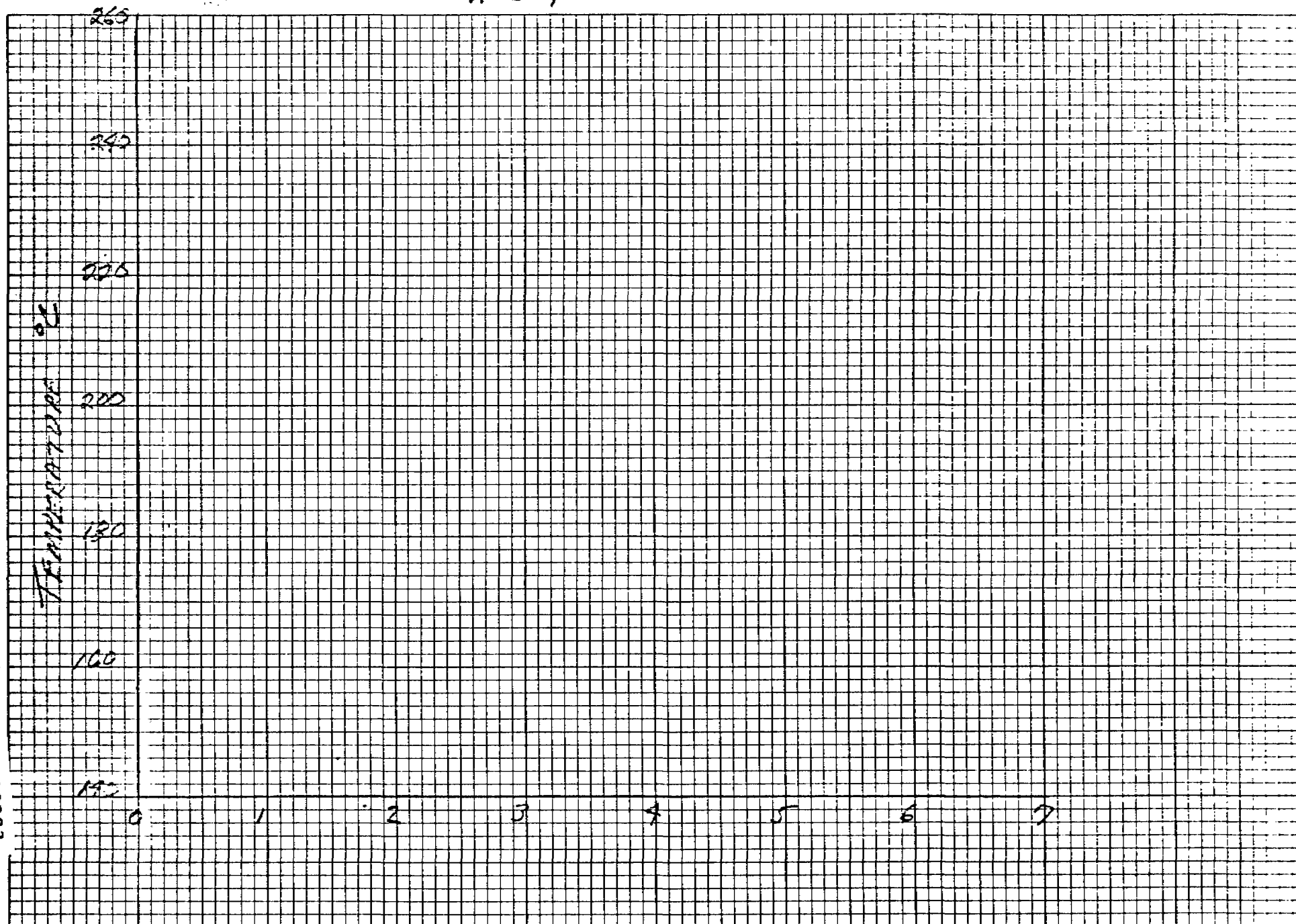
5

6

7

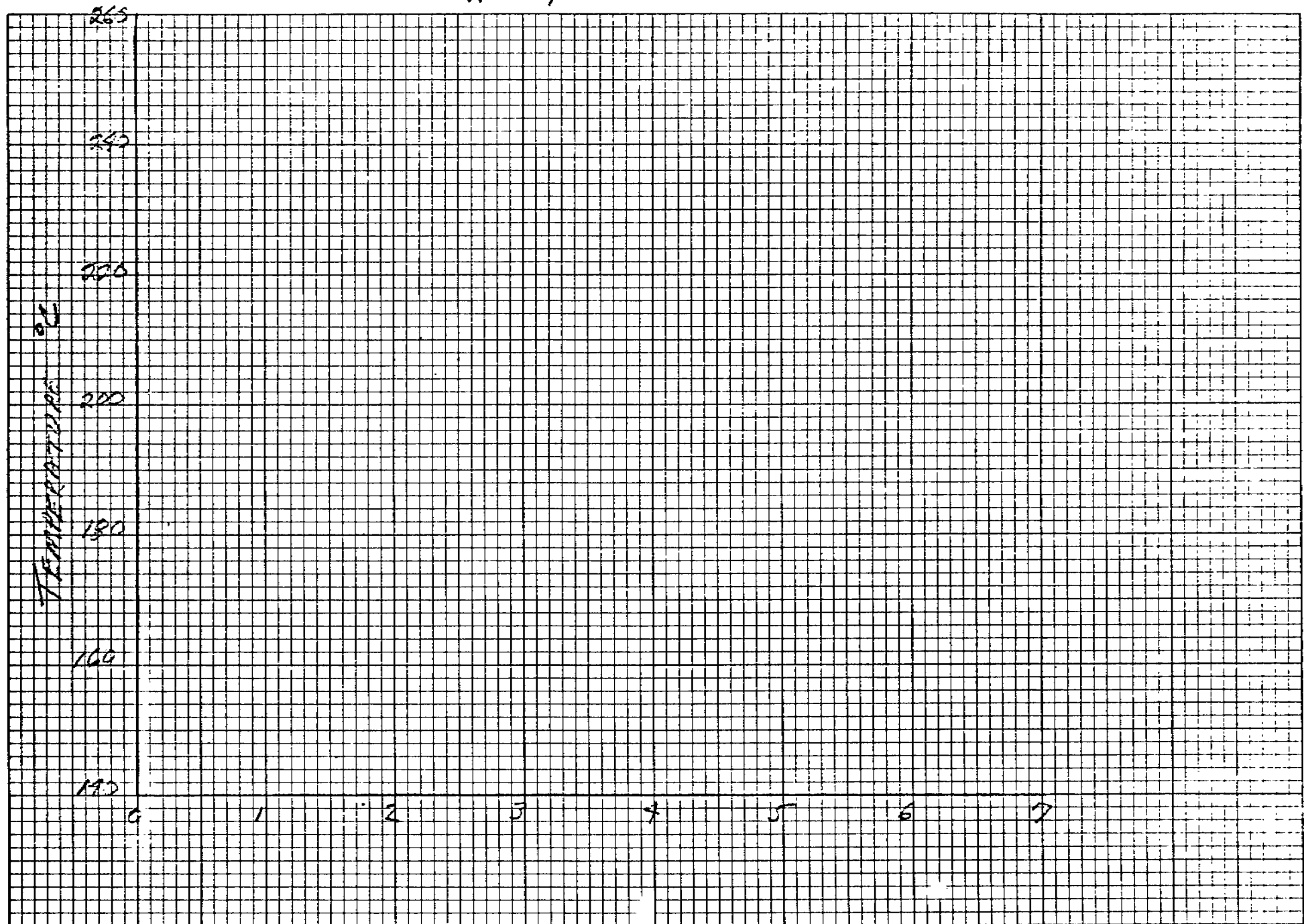
CCR 000008282

R-309

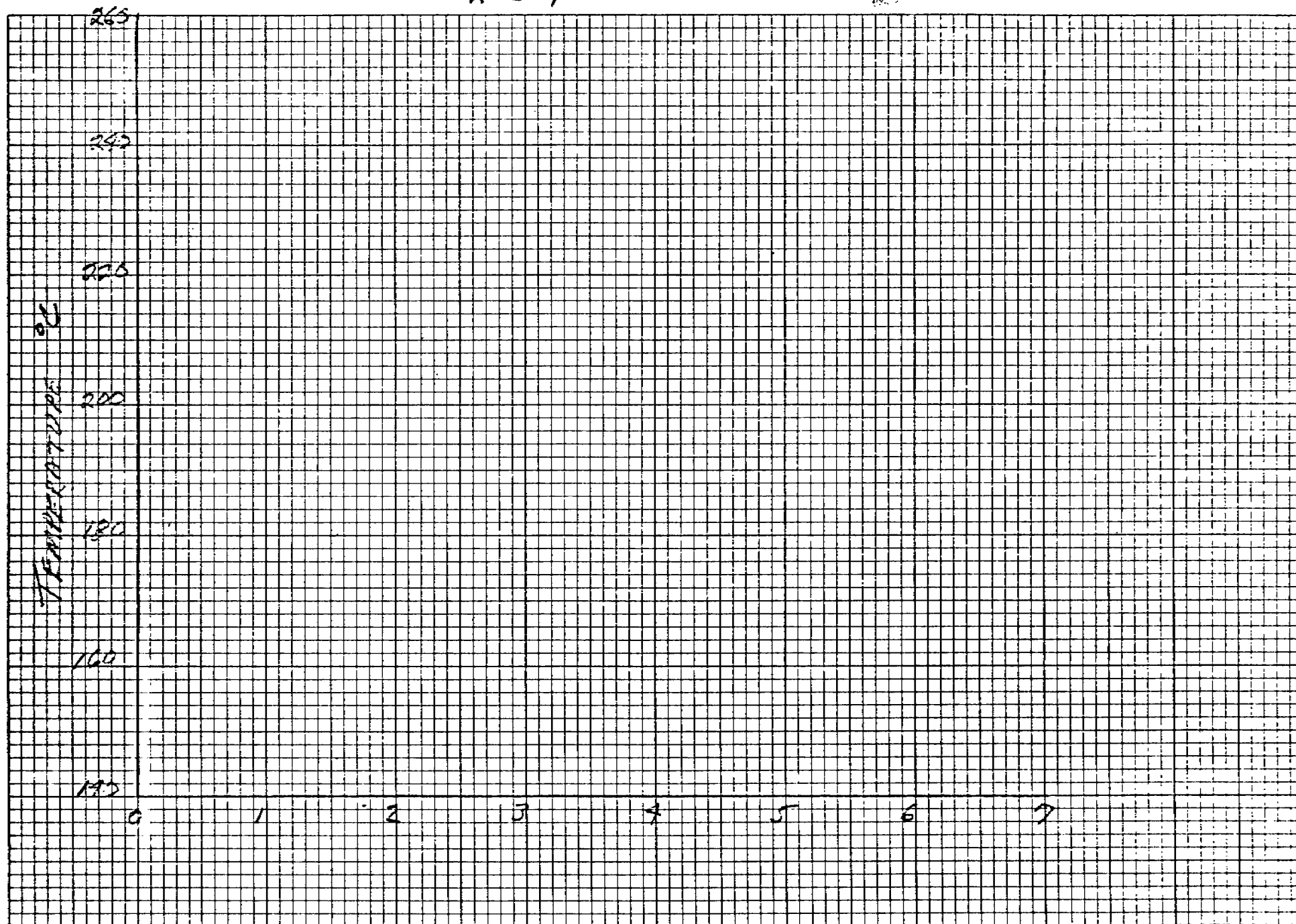


CCR 000008283

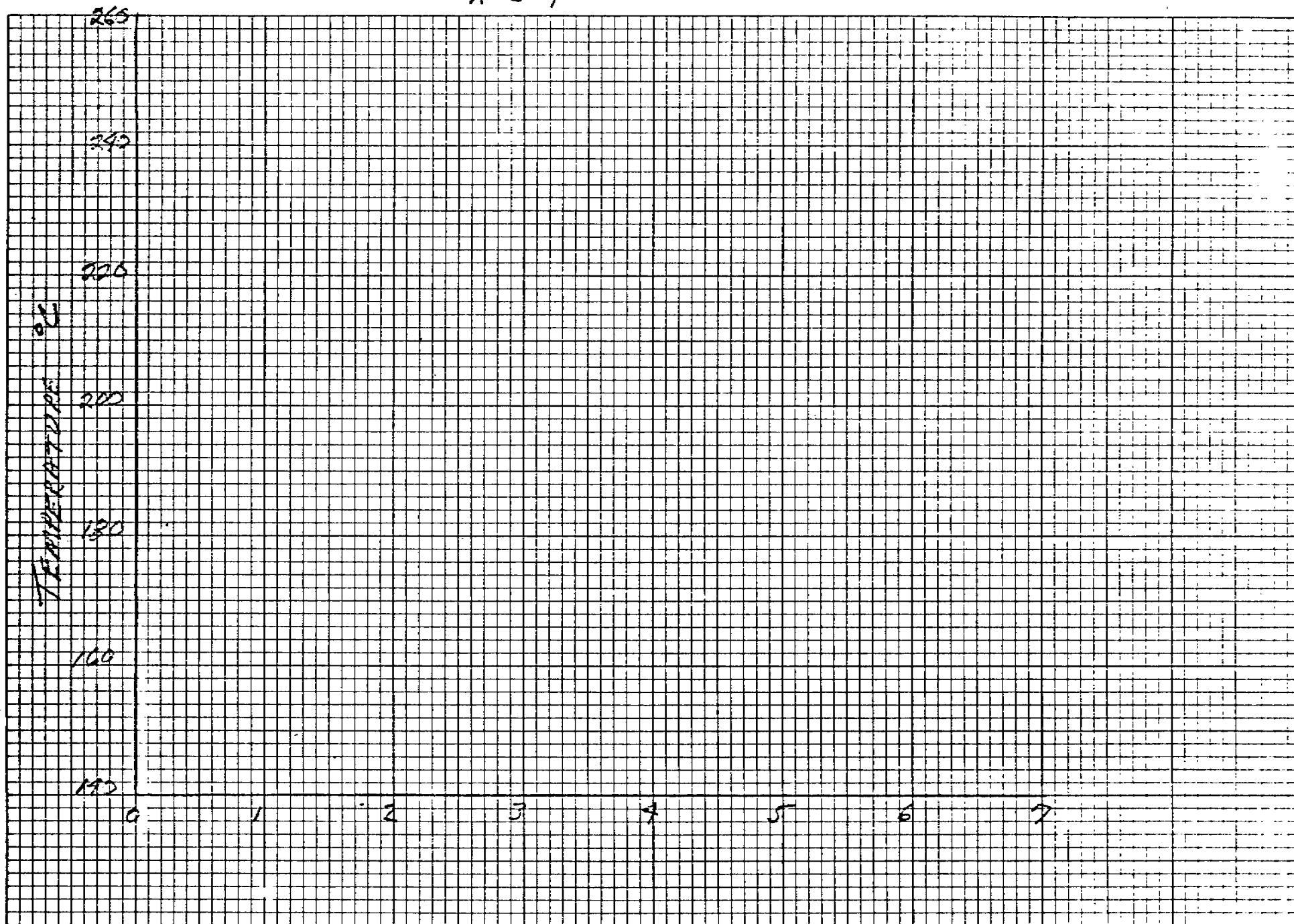
R-309



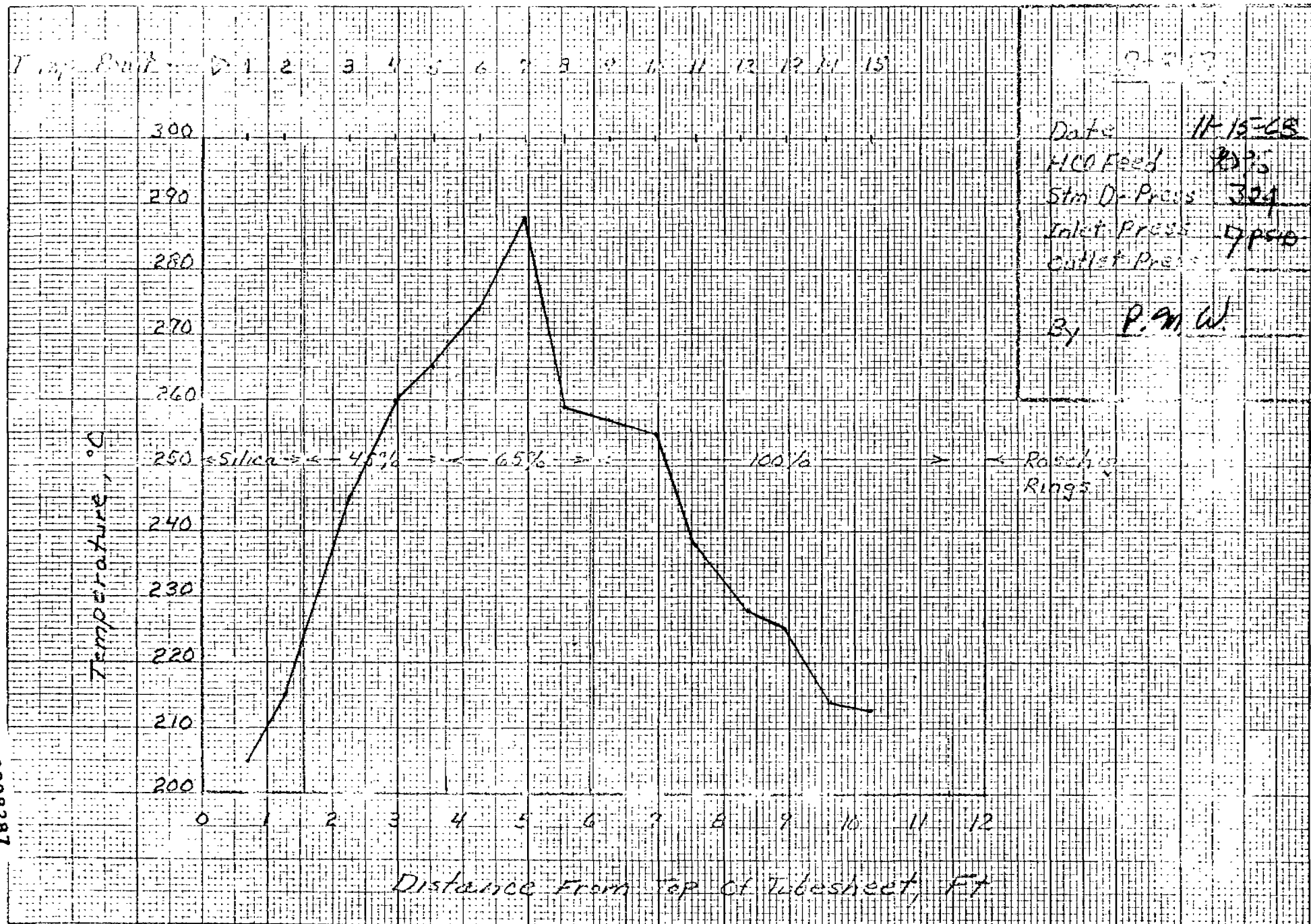
R-309



R-309



CCR 000008286



CCR 000008287

R-301

R-303

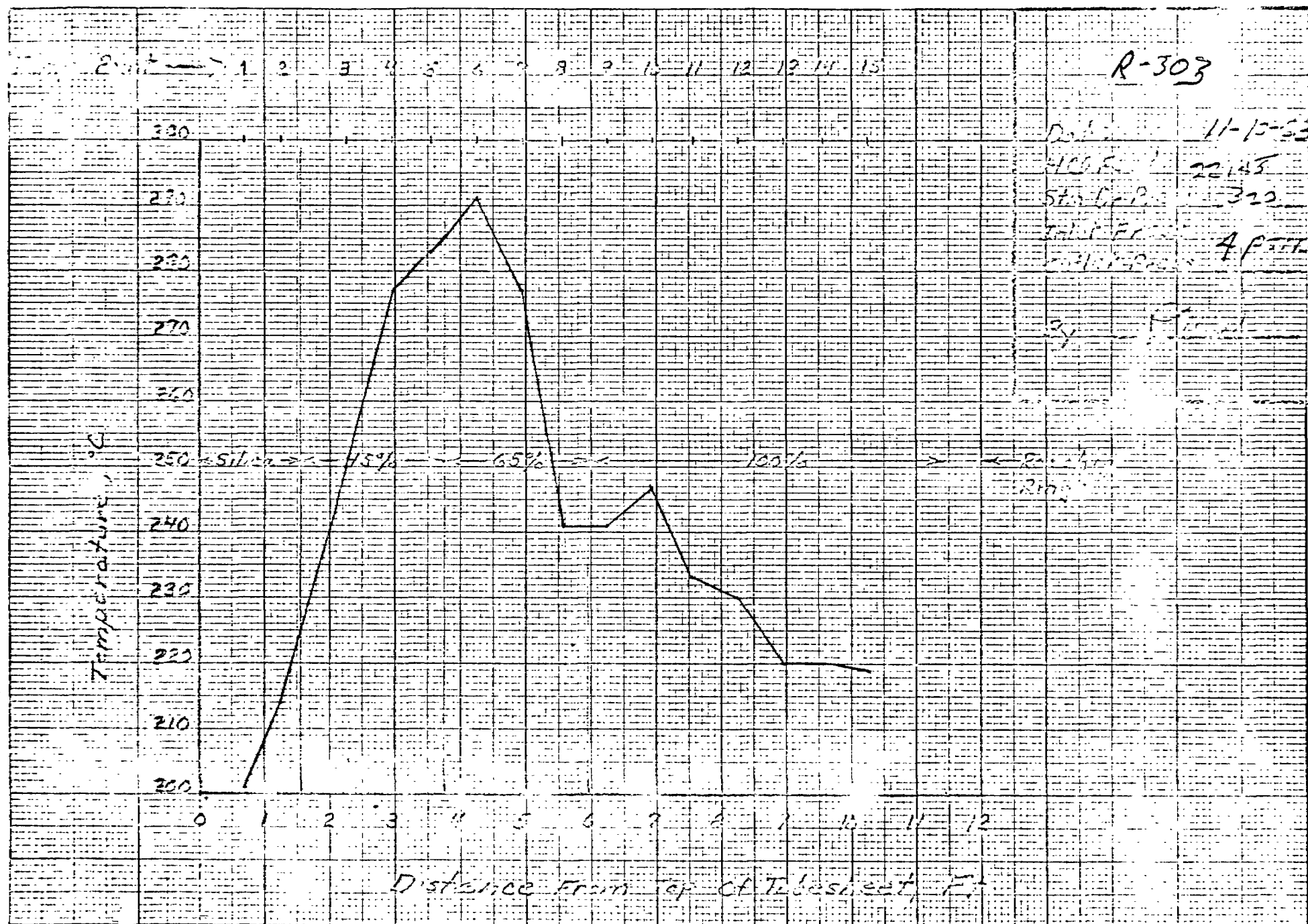
R-304

	Reading	Corrected	Reading	Corrected	Reading	Corrected
1	127	151	167	205	3.72	86
2	162	197	175	215	4.6	103
3	183	226	198	245	9.82	198
4	194	240	208	260	10.8	215
5	209	260	212	265	10.9	210
6	218	272	220	274	9.56	193
7	220	274	228	286	8.6	175
8	218	272	207	259	8.0	165
9	207	258	205	259	7.1	147
10	194	240	204	255	6.65	141
11	190	235	192	238	5.9	127
12	187	236	184	228	5.45	117
13	188	232	182	225	5.28	115
14	186	230	176	214	5.1	113
15	184	228	175	213	5.05	111
16	184	228	—	—	—	—
17	182	225	—	—	—	—
18	179	220	—	—	—	—
19	177	217	—	—	—	—
20	177	217	—	—	—	—

1H 15-65

SUGGESTIONS FOR IMPROVING THERMOCOUPLE MEASUREMENTS ON R-301, R-302 & R-303.

1. BRING SWITCHING BOX INTO CONTROL ROOM
2. LEAD WIRE FROM REACTOR TO CONTROL ROOM TO BE SAME MATERIAL AS THERMOCOUPLE
3. EITHER CHANGE CHROMEL-ALUMEL COUPLE TO Fe-CONST OR DEVICE WAY TO RECALIBRATE ~~THE~~ RECORDER - POSSIBLE SOURCES: L & N, MONITOR MINNY-HONEY
4. PURCHASE A TEMPERATURE COMPENSATED POTENTIOMETER WHICH READS TEMP DIRECTLY FOR Cr-ALUM & Fe CONST ~~AND~~ SOURCE - L & N.
5. SPEED UP RECORDER READING R-303 TEMPERATURE ON "SELECT-O-POINT" POSITION.
6. HAVE EXTERNAL LEAD AT SWITCHING BOX TO READ TEMPERATURE



INTEROFFICE COMMUNICATION

Ponca City, Oklahoma
March 12, 1971

TO: Mr. Jerry Brown, Westlake, Louisiana

SUBJECT: R-304 DESIGN LIMITATIONS - VCM PLANT

The design calculations submitted by Nooter, the Solar expansion joint specifications, and Mr. Churn's heat transfer calculations covering Oxy Reactor R-304 were reviewed as you requested.

VCM personnel should be congratulated on the conservatism, soundness of logic, and thoroughness of detail in their analysis of this problem. The Nooter calculations appear to be on the conservative side and indicate clearly that the nickel tubes would be more than adequate for a 400°F metal temperature at the proposed inlet pressure of 52 psi. The Solar specifications indicate that the expansion joint would be adequate at the higher temperature. Mr. Churn's calculations demonstrate that a maximum temperature of 152°C should be the maximum metal temperature experienced if the highest possible considered hot spot internal temperature of 300°C is reached. Since this is well below the design conditions for the tubes, there is no reason to expect any hazardous consequences from the proposed higher temperature operation. I have no reservations in approving the change, especially as it appears that original design conditions of pressure and temperature will not be exceeded.

If I can be of further service to you in this matter, please let me know.

Norman K. Edwards

Norman K. Edwards
Director
Inspection Division
Maintenance Engineering Department

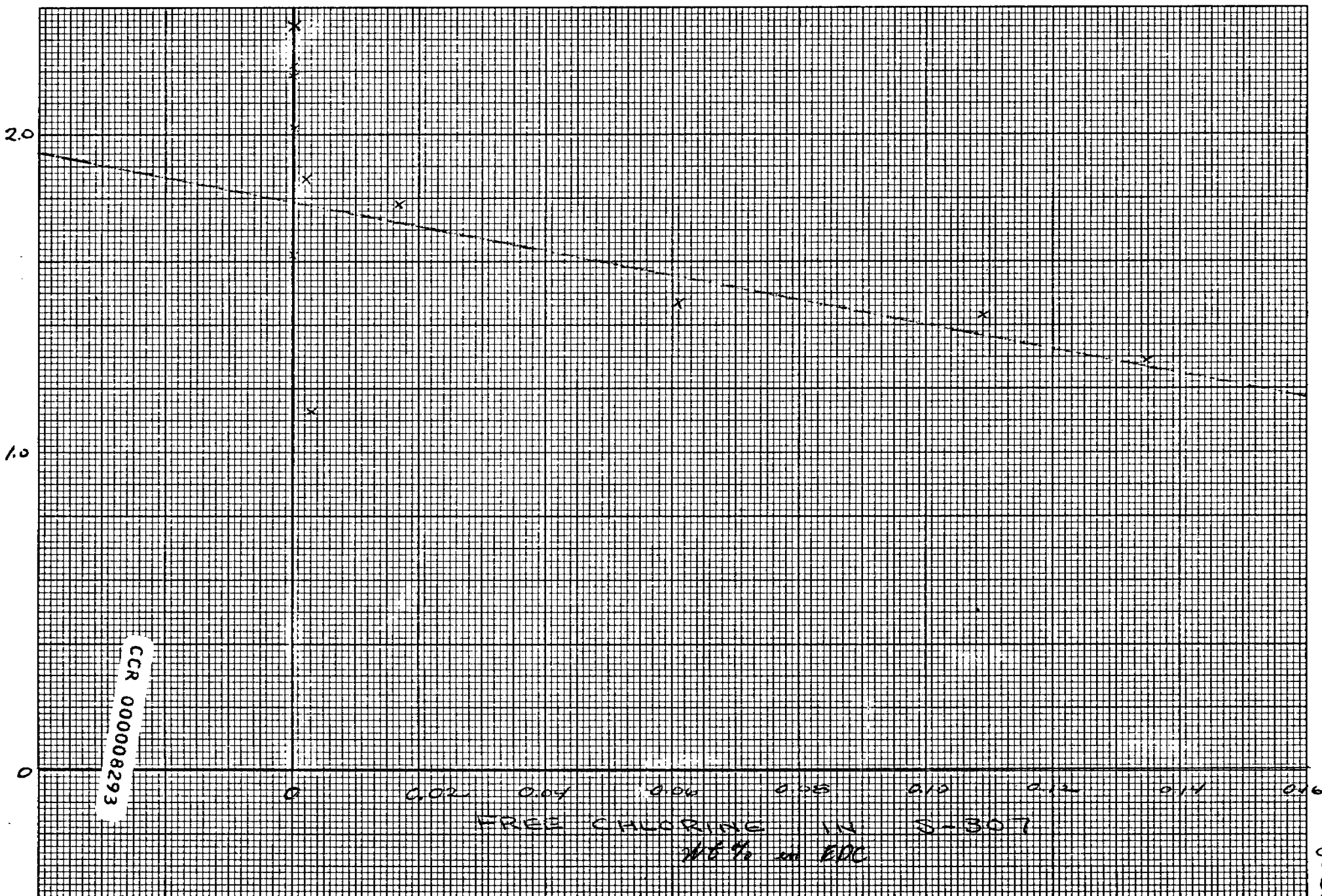
NKE-ch
Carbon copies to:
LNV-RLH-LT

CCR 000008291

Q-304 ~~out~~ data3/19/71
RWC

DATE	2-23	2-25	2-26	2-28	3-1	3-2	3-3	3-4	3-5	3-6	3-7	3-8
ETHYLENE VENT	1.30	1.86	1.47	2.02	2.19	2.22	1.43	1.78	1.62	1.13	1.29	2.34
HYDROCHLORIDE (S-306)	NR	1.3	1.22	1.36	1.29	1.27	1.36	1.09	1.32	1.32	1.26	1.38
" (S-307)	7.67	7.5	7.3	7.71	7.3	6.26	6.61	7.13	7.34	6.73	6.84	7.18
SPOT TEMP	192	200	194	199	195	209	217	213	215	210	197	208
FREE CHLORINE	—	<.002	.061	nil	nil	nil	0.109	.017	nil	$\frac{.003}{.001}$	0.136	nil
CHLORINE ETHYLENE RATIO	0.62	0.65	0.67	0.60	0.63	0.66	0.71	0.71	0.70	0.74	0.72	0.59
ETHYLENE "MISSING"	8.45	4.46	6.3	7.39	5.45	0.79	7.01	2.46	6.08	6.50	4.74	6.88
ETHYLENE CONVERSION	73%	69%	73%	68%	68%	67%	78%	73%	75%	81%	77%	65%
EDC (S-306)	99.86	97.17	94.80	96.23	95.32	95.88	95.42	95.44	95.22	95.22	94.83	95.30
(S-307)	90.62	90.80	90.65	91.09	91.44	92.13	91.87	91.49	91.55	91.45	91.60	91.22
CHLORINE (MOL/HRL)	47.39	61.84	61.2	61.2	70.45	72.82	69.35	73.98	73.98	69.35	62.42	62.42
ETHYLENE (S-309)	4.55	5.64	5.19	5.79	6.31	6.26	5.94	6.10	6.16	5.50	5.31	6.31

262800000 800



3-8-71
Ruc

INTEROFFICE COMMUNICATION

March 3, 1971
Westlake, Louisiana

TO: Oxychlorination File

SUBJECT: Corrosion of R-304

On March 2, 1971, I telephoned Jene Leterle to ask his opinion on the possible risk of severe corrosion if we increased the operating temperature of the oxychlorination cleanup reactor, R-304. I gave him the following information:

- 1) The reactor is used to chlorinate a nitrogen-rich dilute ethylene stream.
- 2) The material of construction of the reactor is nickel 200.
- 3) The reactor presently operates with a hotspot temperature of 200-220°C.
- 4) The inlet gas is saturated with water and has a dew point of 30-40°C at 50-60 psig. This corresponds to approximately 2-4 mole percent water.
- 5) There is very little HCl in the reactor feed, but the effluent can contain several thousand ppm.
- 6) The tube wall temperatures should approach the shell side temperatures (125-135°C) rather than the process temperatures.
- 7) We are not sure how hot we might want to run the reactor, but 300-350°C is not outside the realm of possibility.

Jene returned the call today and indicated that he felt there would be no problem at the temperature range mentioned. In fact he said that 350°C was by no means the limit. He did caution that the tube metal temperature should be kept at least 30°C above the dew point. This is because nickel chloride is hygroscopic and will tend to pick up water as the dew point is approached. I indicated that this would be no problem.

Jene said that he had checked 6 or 7 references and found nothing that would "scare him off". Most of the corrosion rate data that he found indicated rates of about 2 mpy, and even if this data were in error several fold, the corrosion rates would not be excessive. He also indicated that the manner in which the data were obtained would tend to make the results conservative.


R.H. Gerlach

RHG-BS
cc: LNV-RDG-RLH-JDB-JDM-RWC-JFL

CCR 000008294

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — Not Negotiable

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

Carrier's No. _____

J.H. ROSE TRUCK LINES

(Name of Carrier)

Shipper's No. **356**

356

From
AtCONTINENTAL V.C.M. PLANT
WESTLAKE, LOUISIANA 70669

6-21-71, 19

the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Uniform Freight Classification in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to WESTERN RESEARCH CENTER, 1200 S. 47th St., ATT: WENDELL KNOSHAUG

(Mail or street address of consignee—For purposes of notification only.)

Destination RICHMOND, CALIFORNIA State _____ County _____

Delivery

Address ★

(*To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Route RUSH - RUSH - DO NOT DELAY

Delivering Carrier _____

Car or Vehicle Initials _____

No. _____

No. Packages	Kind of Package, Description of Articles, Special Marks, and Exceptions	*Weight (Sub. to Correction)	Class or Rate	Check Column
1	CTN SILICA PELLETS	25#		
	(John Minxott)			

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of Consignor.)

If charges are to be prepaid, write or stamp here, "To be Prepaid."
TO BE PREPAID

Received \$ _____
to apply in the prepayment of the charges on the property described hereon

Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges advanced: \$ _____

Collect On Delivery and remit to

\$ _____

C. O. D. Charge

to be paid by

Shipper ☐Consignee ☐

"Shipper's imprint in lieu of stamp; not a part of bill of lading approved by the Interstate Commerce Commission."

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."
NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding

Continental VCM Plant

P.O. Box 605

Shipper, Per

Jesse H. Coplin

Westlake, Louisiana 70669

Permanent postoffice address of shipper, _____

J.H. ROSE TRUCK LINES

Agent, Per *Blumen*SNAP-A-PART
47-413

MADE IN U.S.A.

CCR 000008295

John Minxott
Just a memo copy to advise shipper

Copper Catalyst Inventory
June 22, 1971

Plus Lot #108 - 30 drums = 8250# delivered after July 1971

Lot 51* (DO NOT USE -PER DAVE PETERS -NOT STOCK) 37 Dr. *10,175*

Lot 52 - 9 Drums

Lot 55 - 1 Drum

Lot 56 - 1 Drum

Lot 57 - 37 Drums

Total 48 Drums x 275# = 13,200#

*+ 10,175
23,375
8,250
31,625 lbs. total*

Teco-Sil Inventory

1150 Bags x 75# = 86,250#



Interoffice Communication

To J. R. Holcomb
From D. C. Skokna
Date June 20, 1973
Subject Oxy Reactor Catalyst Charge for Summer 1973

The next recharge of the oxy reactors shall contain the following pattern:

R-301 (from bottom to top)

7" of $\frac{1}{2}$ " Raschig rings--six boxes (2 cubic feet each)
26" of 100% catalyst--10 drums (Lot #129)
26" of 65% catalyst--10 drums blend (7 drums catalyst - Lot No. 131)
26" of 45% catalyst--10 drums blend (5 $\frac{1}{2}$ drums catalyst - Lot No. 131)
40" of 32% catalyst--16 drums blend (6 drums catalyst - Lot No. 138)
19" of silica in tubes--48 bags (75 lbs. each)
2" of silica on top of tubesheet--15 bags (75 lbs./bag)

R-302 (from bottom to top)

7" of $\frac{1}{2}$ " Raschig rings--6 boxes (2 cubic feet each)
52" of 100% catalyst--21 drums catalyst - Lot No. 129
26" of 65% catalyst--10 drums blend (7 drums catalyst - Lot No. 131)
40" of 45% catalyst--16 drums blend (7 $\frac{1}{2}$ drums catalyst - Lot No. 131)
19" of silica in tubes--48 bags (75 lbs. each)
2" of silica on top of tubesheet--15 bags (75 lbs./bag)

R-303 (from bottom to top)

7" of $\frac{1}{2}$ " Raschig rings--six boxes (2 cubic feet each)
91" of 100% catalyst--37 drums (Lot No. 130)
17" of 90% catalyst--7 drums blend (7 drums catalyst*)
10" of 100% catalyst--4 drums catalyst** (Use, "R-303 Special 100% Blend")
19" of silica in tubes--48 bags (75 lbs. each)
2" of silica on top of tube sheet--15 bags (75 lbs. each)

* (Use: Lot No. 131, 5 Drums - Lot No. 124, 1 Drum - Lot No. 138, 1 Drum)

** (Use: Lot No. 57, 1 Drum - Lot No. 129, 3 Drums)

CCR 000008297

The blends should be made as follows:

<u>Strength</u>	<u>Drums Catalyst Per Batch</u>	<u>Bags Silica Per Batch</u>	<u>Total No. Of Batches</u>
32%	1-Use Lot No. 138	11 Bags + 16 Lbs.	6
45%	1-Use Lot No. 131	7 Bags + 23 Lbs.	13
65%	1-Use Lot No. 131	3 Bags + 16 Lbs.	14

Special Blending For R-303

- 1) 10" - 100% Layer: 3 Batches are required.
1 Batch = 92 Lbs. Lot No. 57 + 1 Drum Lot No. 129

Note: Mark these as, "R-303 Special 100% Blend."

- 2) 17" - 90% Layer: 5 Batches are required.
1 Batch = 55 Lbs. Lot No. 124 + 55 Lbs. Lot No. 138 + 1 Drum,
Lot No. 131 + 68 Lbs. Silica.

- 3) 91" - 100% Layer: Use 37 Drums Lot No. 130.

All drums of blended material should be marked with the catalyst lot number, percent catalyst, date blended, and the reactor for which the catalyst is intended.

D. C. Skokna

D. C. Skokna

is

CC:

RDG-RHG-GGD-HOA(2)-JDM-JCL

CCR 000008298



Interoffice Communication

To J. R. Holcomb
From D. C. Skokna
Date September 20, 1973
Subject Recharge of R-304 Reactor September, 1973

For the recharge of R-304 the following amounts of materials are required:

Houdry spheres - 5250 lbs. - 21 drums (250 lb./drum)
Norton $\frac{1}{4}$ " spheres - LA 3032 - 4000 lbs. - 34 drums (120 lb./drum)
Norton $\frac{1}{4}$ " spheres - LA 3035 - 2500 lbs. - 21 drums (120 lb./drum)
 $\frac{1}{2}$ " Raschig rings, ceramic - 70 cu. ft. - 48 boxes
2" Raschig rings, ceramic - 30 cu. ft. - 15 boxes

The layers of the reactor will be, from bottom to top:

Bottom - 6" of $\frac{1}{2}$ " ceramic Raschig rings - 17 $\frac{1}{2}$ boxes
 40' of Houdry spheres - 21 drums
 28" of Norton $\frac{1}{4}$ " spherical LA-3032 - 34 drums
 16" of Norton $\frac{1}{4}$ " spherical LA-3035 - 21 drums
Top - 6" of $\frac{1}{2}$ " ceramic Raschig rings - 17 $\frac{1}{2}$ boxes
 2" of $\frac{1}{2}$ " ceramic rings over tube sheet - 13 boxes
 2" of 2" ceramic rings over $\frac{1}{2}$ " rings - 15 boxes

The layers are as follows:

6" - 12 fluid oz.
16" - 32 fluid oz.
40" - 81 fluid oz.
28" - 57 fluid oz.

The top three layers can be "loose poured" onto the reactor tube sheet without accurate measurements. This reactor contains 1380 nickel tubes of 2.157" I.D. and 8' tube length.

D. C. Skokna

is
CC:
HOA(2)-RHG-RDG
GGD-JDM-JCL-CEG

CCR 000008299