

Dech. Conneg. File - By Product
Saultoye Chelonia

N32954

DUP050467500

file

R. C. Zolper, Orchem, Wilm.
E. A. Peddrick, Orchem, Wilm. (2)
J. E. Cole, Jr., D&C Building
W. M. Gardner, Admin. Building Trlr.
H. C. Harris, Gen. Anal. Lab.
A. A. Petrone, Admin. Building

October 23, 1972

To: J. Winfield, Sr., Admin. Building

From: B. A. Bell, Miscellaneous Stores

B. A. Bell ↙
RAW MATERIAL SAMPLE - Sulfuryl Chloride

Sample Ref. No. 72-84

From BASF

Approved as a source of supply

Reason meets Specifications

 Per R. Wiederhorn, "Ponsol" Lab.

Comments _____

BAB/kms

N32954.01

DUP050467501

File

B. A. Bell, Em. St. Cont.
J. E. Cole, Jr., D&C Bldg.
M. Fidyk, Building 588
W. F. Huxtable, D&C Bldg.
C. Q. Miller, "Ponsol" Area Lab.
R. Wiederhorn, "Ponsol" Lab.

October 28, 1971

To: J. E. Kutty, D&C Bldg.

From: P. E. Beach, "Ponsol" Lab. *PEB*

BULK HANDLING OF SULFURYL CHLORIDE

The year-to-date (through September) consumption of SO_2Cl_2 was almost 700M pounds. Based on proposed increases in the demand for products made from 1,4-diamino-2,3-dichloroanthraquinone consumption of SO_2Cl_2 could be about 1MM pounds in 1971.

One million pounds of SO_2Cl_2 involves the handling of almost 1,400 drums. This drum handling is not only inefficient but creates a significant drum disposal problem. Approximately 700 of the drums handled are handled as part drums increasing the opportunity for incidents due to mis-identification.

The economics of using bulk SO_2Cl_2 appear attractive. B. A. Bell quotes about \$12.50 per one hundred pounds as opposed to the current \$14.20 per one hundred pounds. Myron Fidyk's work indicates labor saving incentives for going to bulk SO_2Cl_2 .

Safety, efficiency, and economics indicate that at today's consumption levels bulk handling of SO_2Cl_2 is worth consideration.

PEB/lu

Attach.

N32954.02

SULFURYL CHLORIDE BULK VS. DRUM

1. SULFURYL CHLORIDE USAGE

1087 LBS./CHG. X 679 CHARGES*

738073 LBS.

2. STORE HOUSE

RECEIVE DRUMS	0.630 W.U./100#
RECEIVE BULK	<u>0.196 " "</u>
SAVINGS	0.434 " "

738073 LBS./YR X 0.434 W.U./100 LBS =

3203 W.U./YR.

3. BUILDINGS

LOAD 1087 LBS - DRUMS	33.7 W.U./CHG
LOAD 1087 LBS - BULK	<u>4.5 W.U./CHG</u>
SAVINGS	29.2 W.U./CHG

679 CHARGES/YR X 29.2 W.U./CHG

19827 W.U./YR

4. TOTAL W.U. SAVED/YR (2+3) =

23030

5. LABOR DOLLARS SAVED

23030 W.U./YR X \$131.37/1000 W.U. =

\$3025

* 679 CHARGES BASED ON 1972 FORECAST OF
1,4 DIAMINO 2,3 DICHLORO HYDRO.

N32954.03

W. J. Clem, "Ponsol" Lab.
J. F. Froning, D&C Bldg.
R. O. Kettner, Adm. Bldg.
W. S. Murray, "Freon" Office
W. Ramsay, Adm. Bldg.
H. I. Stryker, Adm. Bldg.
T. W. Tomkowit, Adm. Bldg.

August 7, 1968

To: C. L. Richardson, Administration Building
From: C. B. Livingston, "Freon" Office & Laboratory *CBL*

MANUFACTURE OF SULFURYL CHLORIDE (SO_2Cl_2) FOR "PON SOL"

In response to your request, we have examined the possibility of manufacturing SO_2Cl_2 on Chambers Works. It is our understanding that this request stemmed from the recent inability of Hooker (only U.S. supplier of SO_2Cl_2) to meet our increased needs (100M pounds per month versus 45M pounds per month forecast). Conversation with E. A. Peddrick reveals that he is quite optimistic that Hooker will be able to meet our requirements by September.

Production at Chambers Works would not be a difficult undertaking although suitable equipment would have to be procured and installed. The process is very simple, consisting of passing SO_2 and Cl_2 through cooled Inconel tubes packed with charcoal, followed by collection of the condensed product (Ref. 1, 2, 3). Purification is not necessary if the process shown on the attached sketch is used. However, this route would take both time and money to implement and, frankly, does not appear attractive for quick short-term relief.

Much more attractive, should the need persist into September, would be to take advantage of Beaumont's SO_2Cl_2 capability. Their facility is integrated with "Hypalon" manufacture and is presently running at capacity. After September 15, however, their schedule falls to five day per week operation. According to R. P. Madrulli, they could then make our 100M per month SO_2Cl_2 requirements on weekends.

No further work will be done on this project unless specifically requested.

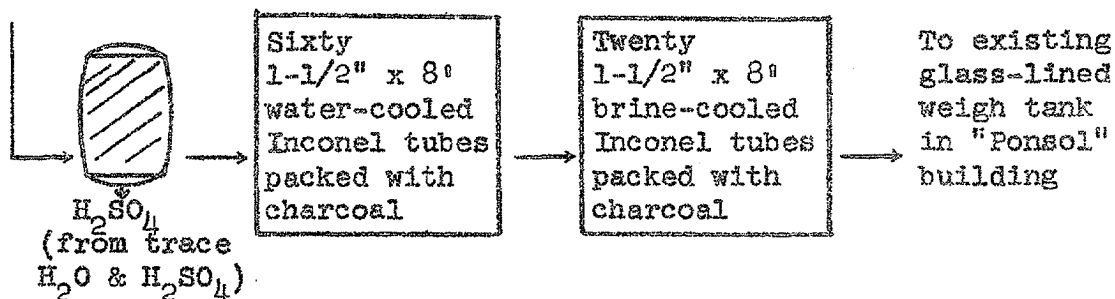
CBL:lg
Attach.

N32954.04

PROPOSED SO_2Cl_2 PROCESS - "PONSOL"

Basis: Assume Manufacture at 100M Pounds per Month

$\left[\begin{array}{c} \text{SO}_2 \\ \text{Cl}_2 \end{array} \right]$ feeds from headers - ratio controlled via Redox system



Charcoal Tank

(assures product free of H_2SO_4 and prevents need to rod spent charcoal from reactor tubes)

Reactors

(low temperature in 2nd reactor gives essentially 100% conversion and insures absence of free SO_2 and Cl_2 in product)



equilibrium constant is such that free SO_2 and Cl_2 are eliminated by the lower temperatures. Substantial dissociation thermodynamically possible at 100°C

References:

1. Kirk Othmer, "Encyclopedia of Chemical Technology," Vol. 13, p. 410.
2. ICI Process, "Sulfuryl Chloride," Dated 1943, Jackson Laboratory File 708-4-1.
3. R. P. Madrucci, Beaumont Elastomers Department, Technical Section.

CBL:lg

N32954.05

DUP050467505

C + F
(Sulphuryl Chloride)

REACTION OF SULPHURYL CHLORIDE WITH DIETHYL ETHER

A Station chemist sent the following article to us from the January, 1966, issue of "Chemistry & Industry" which may be of interest to others here at the Station.

"Recently we attempted to prepare di-isopropyl sulphate following a method (Medvedev and Alexejave, Ber. dt. chem. Ges., 1921, 65B, 132) which involved treating sodium isopropoxide with sulphuryl chloride in diethyl ether. Shortly after the sulphuryl chloride was dissolved in ether, a vigorous, exothermic reaction occurred. Large volumes of hydrogen chloride gas and ether vapour were evolved. Reaction was almost instantaneous in the presence of a trace of hydrogen peroxide or when old stocks of ether were used. Gas chromatographic analysis and fractional distillation of the product obtained by performing the reaction under controlled conditions showed that chlorinated derivatives of diethyl ether, including 1,2-dichloroethyl ethyl ether were formed.

These observations suggest that care should be exercised in the use of sulphuryl chloride in ether as a reagent. The solution is potentially hazardous and side-reactions involving chlorination of the solvent may reduce the yields of desired products."

Copied from the
SAFETY NEWSLETTER
Du Pont Experimental Station
March 28, 1966 Issue

N32954.06