



Lake Charles VCM Plant

Conoco Chemicals Company
A Division of Conoco Inc.
P.O. Box 605
Westlake, Louisiana 70669
(318) 491-5211

February 6, 1981

Dick Wolanski
Technical Director
Huron Valley Steel
1717 Fort Street
Trenton, MI 48183

Dear Mr. Wolanski:

As discussed in our telephone conversation of January 12, I am sending you a sample of spent catalyst from the Conoco VCM Plant oxychlorination process. Also enclosed is a summary of spent catalyst composition and availability. Please let us know if you have an interest in this material after you examine the sample and review the information.

The catalyst is used in the production of ethylene dichloride. It is an alumina catalyst which is impregnated with copper chloride. Three different catalyst manufacturers are used (Stauffer type SCS, BASF type 03-10, and Houdry spheres). Typical analysis of new catalyst, as well as analyses of spent catalyst are attached. The emission spectrographic and atomic absorption analyses are given to provide information on trace metals present while the spent catalyst reactor charge breakdown is the more accurate for major constituents.

The catalyst is currently being disposed of in a land fill and is classified as a hazardous waste by the State of Louisiana because of its high copper content. There are no other known hazards related to the handling of the material. It is neither ignitable, corrosive, reactive, nor toxic according to EPA regulations.

Please do not hesitate to contact me if you have any questions regarding this material.

Sincerely,

David A. Pruitt
David A. Pruitt
Process Engineer

is
Enc
BCC:
JAD-GLF-JWW-DLD-GSH-PLF

CCR 000039826

OXYCHLORINATION SPENT CATALYST

150°C Residue: 98.3 wt. %
450°C Residue: 87.8 wt. %

Emission Spectrographic Analysis

<u>Element</u>	<u>Concentration (ppm unless otherwise noted)</u>
Copper	3.5 wt. %
Silver	<110
Sodium	330
Zinc	<110
Titanium	<110
Zirconium	<110
Cobalt	<110
Strontium	<110
Chromium	<110
Nickel	<110
Iron	1,500
Aluminum	>11 wt. %
Molybdenum	<110
Calcium	320
Vanadium	120
Barium	<110
Manganese	<110
Magnesium	140
Silicon	3.5 wt. %
Boron	<430
Potassium	1,100

ATOMIC ABSORPTION ANALYSIS

<u>Element</u>	<u>Concentration (ppm unless otherwise noted)</u>
Silver	4.2
Beryllium	1.8
Cadmium	3.8
Chromium	7.1
Copper	5.46 wt. %
Lead	140
Manganese	7.4
Tin	39
Iron	460
Aluminum	23.8 wt. %
Antimony	37
Zinc	30
Nickel	120

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SPENT CATALYST PER CHARGE

<u>Component</u>	<u>Reactors</u>				
	<u>R-301</u> <u>Lbs.</u>	<u>R-302</u> <u>Lbs.</u>	<u>R-303</u> <u>Lbs.</u>	<u>R-304</u> <u>Lbs.</u>	<u>R-305</u> <u>Lbs.</u>
Copper	355	460	525	430	200
Potassium	34	42	91	70	-
Carbon	710	400	295	100	-
Chloride	443	580	647	560	-
Al ₂ O ₃	6,263	10,150	9,150	7,540	114,500
FeCl ₃ (ppm)	753 ppm	780 ppm	790 ppm	750 ppm	2,000 ppm
Charge Frequency (Availability)	9 Months	18 Months	9 Months	2 Years	2 Years
Total Lbs.	7,800	11,650	10,700	8,700	115,300
Density lb./ft. ³	45.0±	40.0	43.0	43.0	43

NEW CATALYST PROPERTIES

Stauffer SCS

<u>Type</u>	<u>Bulk Density (lb./ft.³ ± 3 lb./ft.³)</u>	<u>CuCl₂ (wt. %)</u>	<u>KCl (wt. %)</u>
218	50	18 ± 1%	1.8 ± 0.25%
210	46	10 ± 0.7%	3 ± 0.3%
206	44	6 ± 0.5%	3 ± 0.3%

BASF Catalyst 0 3-10

Catalyst Specification

Application

Second generation staged catalyst for the oxychlorination reaction in fixed bed process. This catalyst is supplied in staged activity and therefore used without any inert diluent.

Composition

High purity active alumina with different concentrations of cupric chloride and potassium chloride. Usually 3 different stages of activity are delivered

- 100 % activity
- 65 % activity
- 40 % activity

Form

Pellets 5,5 x 5,5 mm

Bulk density

ca. 680 g/L

Compressive strength

ca. 450 kg/cm² (at the faces)

Abrasion

ca. 1 % wt. (BASF method)

Surface area

ca. 200 m²/g (BET method)

Pore volume

ca. 0,6 cc/g

BASF Catalyst 03-10

NEW CATALYST CHANGES

Catalyst Lot Nr.

	45% 1240 8371240	65% 1241 8371241	100% 1242 8371242
	2587 (45%)	2586 (65%)	2585 (100%)
Chemical Analysis			
Wt % Cu	3.8	6.0	8.5
Wt % K	0.38	0.63	0.85
Wt % Cl	5.0	7.3	10.4
ppm Fe	600	700	800
Loss of ignition			
Wt %	2.1	1.1	2.6
Bulk density			
g/Liter	700	750	850
lbs/cuft	44	47	53
Compressive strength			
kg/cm ²	550	650	785
lbs/sq. inch	8000	9500	11500
Abrasion			
Wt %	0.5	0.5	1.1
Pore volume			
cm ³ /g	0.67	0.62	0.48

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Air Products and Chemicals, Inc.
Box 538, Allentown, PA 18105 U.S.A.
Telephone 215 / 398-6341
TWX 510-651-3686 · Telex 84-7416 · CABLE-AIRPROD



Houdry Division

HOUDRY®HSC®114™ ALUMINA SPHERES

DESCRIPTION

Hard, high surface area, high purity, gamma alumina spheres are available from Houdry to use in traditional alumina applications or as a support material for other impregnated catalytic components.

TYPICAL PROPERTIES

Chemical

Al ₂ O ₃	99.5 +
Na ₂ O	<0.1
Fe ₂ O ₃	<0.05
SiO ₂	<0.04
Sulfate	<0.5

Physical

Size	Spheres 4-6 mm Dia.
Surface Area, m ² /gm	225-275
Pore Volume, cc/gm	0.63
Average Pore Dia.	.75 A°
Attrition Resistance	90 + %
Bulk Density, lbs/ft ³	40-45

SHIPPING

Ex Plant: Paulsboro, New Jersey
Packaged in full open head 55 gallon fiber drums at 275 lbs. net per drum.

CCR 000039833

P.C. people here week of 10/6
Get % water, pH, dewatered, etc. etc. @ time of sample.

GSH 9/24/80

Samples for Hazardous Waste Analysis

Representative sample (HUN getting EPA manual)

Document how we sample

Biosolids -- get seasonal samples over course of year

Waste

When Sampled

✓ Spent calcium chloride

next time dryer is recharged

X ✓ Spent bauxite

" " " " "

✓ Copper chloride catalyst

turnaround

✓ Copper pit precipitate

anytime

✓ Hydrogenation catalyst

turnaround

✓ 305 alumina catalyst

turnaround

✓ Chemical cleaning soln for #302

turnaround

✓ Steam stripper packing

next time stripper is down

✓ F-981 acid transfer catalyst

anytime

✓ F-2 hot oil dryer, F-10, F-500

anytime

✓ wet equalizing hot basin sludge

anytime

✓ wet " " "

"

✓ Ash sludge

"

✓ Biosolids

"

✓ HCl absorber packing

when absorber is down

✓ Centrifugal scrubber packing

" scrubber is down

✓ Instrument air dryer desiccant

sample new desiccant

✓ demineralizer desiccant

when recharged

✓ solvent in drum

anytime

✓ Steam stripper acid bucket

when replaced

✓ Teflon liners

"

✓ HCl absorber

"

✓ HCl absorber

anytime

✓ wet sample inside EDC tank

"

✓ FILTER BAGS

✓ Filter baghouse catalyst

CCR 000039834