

Interoffice Communication

RECEIVED
OCT 24 1978

① DAK
② file - PVC

To A. J. Lundeen

From J. A. Wingrave

Date October 11, 1978

Subject LIBRARY COMPUTER SEARCH: TOXICOLOGICAL PRODUCTS FROM
ENVIRONMENTAL DECOMPOSITION OF PVC

The purpose of this search (by John Foell) was to locate published articles which stated that environmental decomposition products of PVC were "safe". In summary, no such article was found although we do have articles in hand stating that PVC is inert under environmental conditions in the absence of sunlight. In the presence of sunlight these articles further state that HCl and polyenes are formed. However, no statement in any article so far located assesses the relative toxicology of these decomposition products by environmental degradation.

What follows is a break down of the aforementioned library search given for documentation purposes should future searches be made.

File Searched: Medline (Topics Searched: Titles Found)

1. PVC and Biodegradation: none
2. PVC and Adverse Effects: 49, See Appendix I
3. 1 and Environmental Pollutants: none
4. 1 and Soil pollutants: none
5. 1 and Refuse disposal: none

File Searched: Toxline (Topics Searched: Titles Found)

1. PVC: 468: not listed
2. Polyvinyl and Chloride: 426: not listed
3. 1 and 2: 778: not listed
4. 3 and All Biodegradable: 0
5. All Particles or All Particulates: 3477: not listed
6. 3 and 4: 40: see Appendix II
7. All Dust # or All Powder #: 8469: not listed
8. 3 and 7: 39: not listed
9. 8 and not 6: 33: Appendix III
10. All Outdoor #: 315: not listed
11. 3 and 10: 0

James A. Wingrave
J. A. Wingrave

clk

cc: PAS:GJH:RAF (JFF)

✓ articles of interest
* we have these
articles in our files

SAL 000047789

APPENDIX I

- 1
11 - [Respiratory functional changes caused by chronic exposure to monomeric and polymeric vinyl chloride]
- 2
11 - [Hygienic evaluation of films intended for the waterproofing of unit prefabricated swimming pools]
- 3
11 - Perforation of feeding tube into right main bronchus.
- 4
11 - Polyvinyl chloride pneumoconiosis.
- 5
11 - Safety evaluation of medical plastics.
- 6
11 - Necrotizing enterocolitis and plastic colostomy. pp. 79-83.
- 7
11 - [Environmental dust in a plant for the production of polyvinyl chloride] ✓
- 8
11 - Hazards of blood transfusion.
- 9
11 - What is the toxicological importance of the liberation of phthalates from plastic containers into blood, its components and derivatives?
- 10
11 - Mortality among employees of PVC fabricators.
- 11
11 - Dermatitis from epoxy resins and formaldehyde in chamber packers.
- 12
11 - A complication of tracheal intubation: distal blocking of the tube.
- 13
11 - Scintigraphy of liver and spleen in vinyl chloride workers.
- 14
11 - Effects of a plasticizer leached from polyvinyl chloride on the subhuman primate: a consequence of chronic transfusion therapy.
- 15
11 - Transient hypoxemia induced following inhalation of smoke.

GAL 000047790

16
II - Respiratory tract illness in heat wave (letter)

17
II - Considerations on etiologic factors in heat wave (letter).

18
II - [Respiratory diseases in workers exposed to polyvinyl chloride
(editorial)]
CONTINUE PRINTING? (YES/NO)

USER:

Y

PROG:

19
II - An approach to the toxicology of combustion products of
materials.

20
II - PVC: health implications and production trends. ✓

21
II - A rare complication of use of the middle ear ventilation tube
(PVC).

22
II - [Occupational risk in the production of polyvinyl chloride]

23
II - Respiratory status of Los Angeles firemen, four-month follow-up
after inhalation of dense smoke.

24
II - Urinary porphyrins among PVC workers. pp. 452-5.

25
II - Respiratory health and polyvinyl chloride fumes (letter).

26
II - Case report: complication of a polyvinyl chloride endotracheal
tube.

27
II - [Microintoxication in the polyvinyl chloride film industry]

28
II - Polyvinyl chloride film thermal decomposition products as an
occupational illness: 2. Clinical studies.

29
II - Polyvinyl chloride film thermal decomposition products as an
occupational illness: 1. Environmental exposures and toxicology.

30
II - [Laryngo-tracheal stenosis after intubation during resuscitation
(notes apropos of a series of complications)]

31
II - Perspective in a part of the...

SAL 000047791

32

II - Elevated CEA levels in polyvinyl chloride workers.

33

II - [Risks to consumers and PVC workers from vinyl chloride]

34

II - Thrombus formation on cannulating vessels: cannula in sheep: effects of time, size and materials.

35

II - Effect of occupational and nonoccupational factors on the respiratory system of vinyl chloride and other workers.

CONTINUE PRINTING? (YES/NO)

USER:

7

PAGE:

36

II - Letter: Resorption of the mandible in vinyl chloride acro-osteolysis.

37

II - Miscellaneous symptoms occurring in workers engaged in the manufacture of PVC.

38

II - Capillary abnormalities in polyvinyl chloride production workers. Examination by in vivo microscopy.

39

II - Experimental and clinical evaluation of a new catheter material.

40

II - Letter: "heat-wrappers" asthma.

41

II - Clinical and bronchial provocation studies in patients with heatwrappers' asthma.

42

II - An experimental evaluation of the types of material used for bile duct drainage tubes.

43

II - Tissue response to implanted polymers: the significance of sample shape.

44

II - Letter: Angiosarcoma of the liver in P.V.C. fabricators.

45

II - Pulmonary changes among vinyl chloride polymerization workers.

46

II - Comparison of PVC and glass containers in the prevention of contamination and thrombophlebitis in intravenous therapy.

47

II - Editorial: Heatwrappers' respiratory tract disease.

SAL 000047792

47

TI - Editorial: Meat-wrappers' respiratory tract disease.

48

TI - Thermoactivated price-label glue intolerance. A cause of meat-wrappers' asthma.

49

TI - Respiratory tract illness in meat wrappers.

SS 3 /C?

USER:

PRINT FULL 1 SKIP3

PROG:

'SKIP3' IS NOT A VALID PRINT PARAMETER. COMMAND IGNORED.

SS 3 /C?

USER:

PRINT FULL 1 SKIP 3

PROG:

4

AU - Arnaud A

AU - Pommier de Santi PP

AU - Garbe L

AU - Payan H

AU - Charpin J

TI - Polyvinyl chloride pneumoconiosis.

LA - Eng

MH - Case Report

MH - Comparative Study

MH - Cytoplasm/ULTRASTRUCTURE

MH - Histiocytes/ULTRASTRUCTURE

MH - Human

MH - Lung/ULTRASTRUCTURE

MH - Macrophages/ULTRASTRUCTURE

MH - Male

MH - Middle Age

MH - Phagocytosis

MH - Pneumoconiosis/*ETIOLOGY/PATHOLOGY

MH - Polyvinyl Chloride/*ADVERSE EFFECTS/ANALYSIS

MH - Polyvinyls/*ADVERSE EFFECTS

MH - Pulmonary Fibrosis/ETIOLOGY/PATHOLOGY

CI - 0040-6376 33:19 78

SO - Thorax 33(1):19-25, Feb 78

SS 3 /C?

USER:

PRINT 1 AU, TI, SO, AB SKIP 6

PROG:

SAL 000047793

7

- AU - Casula D
- AU - Cherchi P
- AU - Spiga G
- AU - Spinazzola A
- TI - [Environmental dust in a plant for the production of polyvinyl chloride]
- AB - The results of an investigation on environmental dust concentration and individual dust exposure in a drying and sacking section of an "emulsion" and "suspension" PVC plant are reported; data on environmental concentration and individual dust exposure have been obtained by gravimetric techniques using similar personal and static dust samplers. Morphology and particle size distribution have been studied by electron microscopy on airborne dust specimens. Morphological analysis showed remarkable differences concerning shape and size between particles sampled in the "suspension" polymer and "emulsion" polymer sacking sections. Remarkably high mean values concerning dustiness have been observed: 1.30 mg/m³ (min. 0.15; max. 18.4 mg/m³) for environmental concentration and 5.39 mg/m³ (min. 0.28; max. 45.6 mg/m³) for individual exposure.
- SO - Ann Ist Super Sanita 13(1-2):189-98, 1977

SS 3 /C?

USER:

PRINT 1 AU, TI, SO, AB SKIP 9

PRG0:

10

- AU - Chianze L Jr
- AU - Nichols WE
- AU - Wong D
- TI - Mortality among employees of PVC fabricators.
- AB - A cross-sectional mortality study of 4,341 deaths occurring among current and former employees of 12 PVC fabricators during 1964-1973 is presented. The objectives are: (1) to identify any angiosarcoma deaths among the employees of these fabricators, and (2) to examine the distribution of deaths by cause. No angiosarcoma deaths were found among the study group. Sex-race-cause-specific Proportionate Mortality Ratios (PMR's) were computed, using the corresponding U.S. mortality as the standard. Among white employees, there appears to be an excess in total cancer mortality, particularly that of the digestive system. Observed deaths were found to exceed the expected in cancers of the breast and urinary organs among white females. Deficit mortality was observed in cirrhosis of liver among both male and female white employees.
- SO - JOM 19(9):623-8, Sep 77

SAL 000047794

18

AU - Dror K

TI - [Respiratory diseases in workers exposed to polyvinyl chloride
(editorial)]

SO - Harefuah 92(6):283-4, 15 May 77

SS 3 /C?

USER:

PRINT 1 AU, TI, SO, AB SKIP 19

PROG:

20

AU - Karstaad M

TI - PVC: health implications and production trends.

AB - Poly(vinyl chloride) (PVC) is a complex plastic system.

Individual components of the PVC system, including residual vinyl chloride monomer (RVCM) and certain additives, may pose risks of harm to human health. There have been significant reductions in the RVCM content of PVC resin since 1974, reducing the cancer risk of workers in PVC fabrication plants and consumers of PVC products. A "no-effect" level for vinyl chloride monomer (VCM)-induced carcinogenesis has not been found to date; therefore, the significance of human exposure to low levels of RVCM remains to be determined. Exposure to PVC dust may cause pulmonary dysfunctions. Pulmonary and other possible health effects of PVC dust require further study. The PVC plastics system should be characterized as to interactions among its various components and as to interactions of the components and the PVC system as a whole with biological systems.

SO - Environ Health Perspect 12:107-15, Oct 76

SS 3 /C?

USER:

PRINT 1 AU, TI, SO, AB SKIP 19

PROG:

22

AU - Orusev I

AU - Popovski F

AU - Bauer S

AU - Nikolova K

TI - [Occupational risk in the production of polyvinyl chloride]

SO - God Zb Med fak Skopje 23:33-8, 1975

SS 3 /C?

USER:

PRINT 1 AU, TI, SO, AB SKIP 3

PROG:

32

AU - Vale PI

AU - Kipling ML

AU - Walker AE

TI - Miscellaneous symptoms occurring in workers engaged in the manufacture of PVC.

SO - J Soc Occup Med 26(3):95-2, Jul

SAL 000047795

APPENDIX II

- 1
II - Particles of di(2-ethylhexyl)phthalate in intravenous infusion fluids migrating from polyvinyl chloride bags.
- 2
II - Physicochemical aspects of the extraction in blood and the disposition in rats of di-(2-ethylhexyl) phthalate plasticizer.
- 3
II - Polyvinyl chloride pneumoconiosis.
- 4
II - Control of agricultural pests using particles with retarded release
- 5
II - Physicochemical aspects of the extraction in blood and the disposition in rats of bis(2-ethylhexyl) phthalate plasticizer
- 6
II - [Environmental dust in a plant for the production of polyvinyl chloride] ✓
- 7
II - What is the toxicological importance of the liberation of phthalates from plastic containers into blood, its components and derivatives?
- 8
II - Apparatus for treatment of waste water
- 9
II - Particle size effects in the determination of respirable alpha-quartz by x-ray diffraction
- 10
II - Pulmonary modifications and exposure to vinyl chloride and poly(vinyl chloride) ✓
- 11
II - Thermooxidative cable decomposition - emissions and their reduction
- 12
II - Blowing away of submicron aerosol particles from ultrafine PP fibers
- 13
II - High volume sorbent sampling for pesticide analysis
- 14
II - Disposal of transuranic solid waste using Atomic International's molten salt combustion process. II

SAL 000047796

15

- II - Particles of di-2-ethylhexyl phthalate in intravenous infusion fluids migrating from polyvinyl chloride bags

16

- II - Combustion of plastics

17

- II - Development of instrumentation for quantitative collection of total atmospheric mercury from ambient air

18

- II - Heavy metal collecting agents

19

- II - Model experiments for the investigation of the single determining factors in the dissolution rate of poly(vinyl chloride)-matrix tablets

20

- II - A surface-active agent involved in PVC-induced hemolysis ✓

21

- II - Plasticized PVC for pharmaceutical applications

22

- II - Responses of alveolar macrophages to metallic fumes

23

- II - Vacuum pyrolysis of polymer versus pollution

24

- II - Chemical treatment of waste water

25

- II - The analytic tape SFL-8-50 and filters AFAS-R for determination of mercury content in gases.

26

- II - Effect of various factors on the amount of plasticizer in intravenous solutions packaged in flexible bags

27

- II - Microbial and particulate contamination during prolonged use of intravenous infusion sets

28

- II - Particulate contamination and stability of three additives in 0.9% sodium chloride injection in plastic and glass large-volume containers

29

- II - Generation of particulate matter in large volume parenteral containers

30

- II - Particulate matter in polyvinyl chloride intravenous bags

CONTINUE PRINTING? (YES-#)

SAL 000047797

31

TI - Investigations of various domestic vacuum cleaners from the point of view of hygiene.

32

TI - Responses of alveolar macrophage to metallic dusts.

33

TI - HEMATOGENOUS DISSEMINATION OF INGESTED POLYVINYL CHLORIDE PARTICLES.

34

TI - Problems associated with the use of membrane filters for dust sampling when compositional analysis is required.

35

TI - Evaluation and reduction of air contaminants produced by thermal cutting and sealing of PVC packaging film.

36

TI - Creation of air pollution by burning of thermoplastic materials used as raw material in disposable medical supplies.

37

TI - Chemical contamination of stored blood.

38

TI - Paste for absorbing X-rays or the like

39

TI - Floating of acrylonitrile-butadiene copolymers

40

TI - Letters: particulate matter in polyvinyl chloride intravenous bags.

6

AU - Casula D

AU - Cherchi P

AU - Spiga G

AU - Spinazzola A

AA - Istituto di Medicina del Lavoro, Università di Cagliari.

TI - [Environmental dust in a plant for the production of polyvinyl chloride]

SI - TOXBIR/78/101476

SO - Ann Ist Super Sanita: VOL 13, ISS 1-2, 1977, P189-98

LA - Ita

AB - The results of an investigation on environmental dust concentration and individual dust exposure in a drying and sacking section of an "emulsion" and "suspension" PVC plant are reported; data on environmental concentration and individual dust exposure have been obtained by gravimetric techniques using similar personal and static dust samplers. Morphology and particle size distribution have been studied by electron microscopy on airborne dust specimens. Morphological analysis showed remarkable differences concerning shape and size between particles sampled in the "suspension" polymer and "emulsion" polymer sacking sections. Remarkably high mean values concerning dustness have been observed: 1.30 mg/m³ (min. 0.15; max. 18.4 mg/m³) for environmental concentration and 5.39 mg/m³ (min. 0.28; max. 45.6 mg/m³) for individual exposure.

SAL 000047798

SS 7 /C?

USER:

PRINT FULL 1 SKIP 10

PROG:

11

AU - Sieth J

AA - Ger.

TI - Thermooxidative cable decomposition - Emissions and their reduction

SI - CA/087/0897897

SO - Schriftenc. LK; VOL 35. 1975,10-8

LA - Ger

AB - CBAC COPYRIGHT: CHEM ABS In the thermal treatment of cable wastes, the insulation components, e.g. PVC, yield gaseous pollutants, e.g. HCl, along with solid particles, which are emitted into the atm. (9002-86-2 PVC) Emissions of 10 g HCl/m³ air were obsd. Washing of waste gas can control pollution.

35

AU - VAN HOUTEN RW

AU - CUDWORTH AL

AU - IRVINE CH

TI - Evaluation and reduction of air contaminants produced by thermal cutting and sealing of PVC packaging film.

SI - HEEP/75/61620

SO - AN IND HYG ASSOC J; 35 (4). 1974 394-397

AB - HEEP COPYRIGHT: RIDL ABS. Polyvinyl chloride film (PVC) is used to package meats and other food products in retail establishments. Machines used for this purpose cut PVC film by means of a hot wire and seal wrapped packages on an electrically heated pad. Laboratory tests were conducted to evaluate the amount and type of decomposition products to which an operator might be exposed. Test results showed that under artificially severe operating conditions, concentrations of hydrochloric acid or of total particulates in the operator's breathing zone did not reach the threshold limit value for occupational exposure. By controlling the temperature, of the cutting wire, it is possible to greatly reduce fume production. Data is provided relating fume production to operating temperature and specific recommendations are made for the reduction of the contaminants.

SAL 000047799

APPENDIX III

FROM:

- 1
II - Utilization of industrial dusts
- 2
II - [Experimental substantiation of the maximum permissible concentration (MAC) of polyvinyl chloride resin]
- 3
II - Outline of air pollution survey
- 4
II - Alveolitis fibrosa - An occupational disease
- 5
II - [Occupational dermatitis due to inhalation and ingestion]
- 6
II - Nitrohumic acid-like compound from poly(vinyl chloride)
- 7
II - Use of the fine fiber filters FF for determining the concentrations of dust and separate chemical elements in air
- 8
II - Separation of oil from water
- 9
II - Study of the repellent properties of polymers towards rodents
- 10
II - Sustained release chlorpheniramine maleate tablets. Part I. - Using water-imperious materials
- 11
II - Heavy metal scavengers
- 12
II - Occupational pneumosclerosis ✓
- 13
II - Occupational lead exposure in Finland. 19. Poly(vinyl chloride) plastic industry ✓
- 14
II - Experience with assessing the hygienic and economic effects of health measures aimed at improving working conditions in production of plasticized poly(vinyl chloride) films
- 15
II - Vinyl chloride and the production of PVC ✓
- 16
II - Health hazard evaluation/toxicity determination report H.H.E. 74-61-232, Gates Rubber Company, Denver, Colorado ✓
- 17
II - Slow-release formulation

SAL 000047800

18

II - Observations on the oral administration and toxicity of vinyl chloride in rats

CONTINUE PRINTING? (YES/NO)

USER:

Y

PROG:

19

II - Biological reactivity of PVC dust ✓

20

II - Gynecological morbidity in women engaged in the production of ethylenediamine and various chlorinated hydrocarbons.

21

II - Occupational lead exposure in Finland. IV. The polyvinyl chloride plastic industry. ✓

22

II - Pulmonary function defects in nonsmoking vinyl chloride workers.

23

II - [Experimental pulmonary lesions caused by prolonged inhalation of PVC dust in work areas] ✓

24

II - Mineralization of analytical microfiber filters made from chlorinated PVC (polyvinyl chloride)

25

II - Low volume application by fine dust formulations (FD formulations) as a new method for pest control in green house.

26

II - Observations on the oral administration and toxicity of vinyl chloride in rats.

27

II - Occupational lead exposure in Finland: IV. The polyvinyl chloride plastic industry.

28

II - Hygienic evaluation of working conditions and health status of workers in the production of block polyvinylchloride.

29

II - Dentifrice preparation

30

II - BIOLOGICAL REACTIVITY OF PVC DUST

31

II - Biological reactivity of PVC dust. ✓

32

II - How to control worker exposure to vinyl chloride. ✓

SAL 000047801

33

II - Changes in pulmonary function in workers exposed to vinyl chloride and polyvinyl chloride.

SS 10 /C?

USER:

PRINT FULL 1 SKIP 1

PROG:

2

AU - Khristeva V

AU - Spasovski M

II - [Experimental substantiation of the maximum permissible concentration (MAC) of polyvinyl chloride resin]

SI - TOXBIB/78/178920

SO - Probl Khig; VOL 2, 1975, P39-44

LA - Bul

AB - The acute and chronic oral, dermal and inhalatory toxicity of PVH resin is studied in white rats. It is established that in acute treatment, irrespective of the route of PVC resin penetration into the organism, its effect proves weakly toxic. During chronic oral and inhalatory experiments, a slight affection of peripheral blood elements only is noted. In the lungs of the animals inhaling 2 and 6 mg/m3 concentrations for a duration of four months, no changes are detected which might be interpreted as being PVH specific. Cumulative effect, and skin stimulating and sensitizing action of the polymer are neither established. Against the background of the obtained results, a provisional normal MAC value is proposed, namely 2 mg/m3 of PVH dust in the air of the working environment.



SS 10 /C?

USER:

PRINT FULL 1 SKIP 5

PROG:

6

AU - Yoshida H

AU - Arita S

AU - Nakagawa M

AA - Japan

II - Nitrohumic acid-like compound from poly(vinyl chloride)

SI - CA/087/058102X

SO - Japan. Kokai PATENT NO. 26111289 10/01/76 (Agency of Industrial Sciences and Technology)

AB - CBAC COPYRIGHT: Chem Abs Scrap or waste PVC is chopped or pulverized, heated at 200-450.degree., then reacted 0.3-10 h with 1-10N HNO3 to obtain a nitrohumic acid-like compd. which is used as an adsorbent for heavy metals. Thus, PVC powder was heated 6 h at 200.degree., then reacted 10 h with 10N HNO3 at approx.100.degree., and the yield was 70%. (5002-86-0 PVC)

SAL 000047802

19

AU - Richards RJ
 AU - Desai R
 AU - Hext PH
 AU - Rose FA
 AA - Dep. Biochem., Univ. Coll., Cardiff, Wales
 TI - Biological reactivity of PVC dust
 SI - CA/084/013118D
 SO - Nature (London); VOL 256, ISS 5519, 1975, 684-6
 LA - Eng
 AB - CBAC COPYRIGHT: CHEM ABS. Of 2 conc. produced PVC powders, KM 1 was highly hemolytic at low concns. whereas PH 2 was practically nonhemolytic. (9002-86-2 PVC) 1M 1 PVC and asbestos (2.5 mg) both produced 100% lysis of rabbit erythrocytes but the latter was more rapid. Hemolytic activity of KM 1 PVC was reduced 60% after a single washing and the wash soln. had limited hemolytic activity. KM 1 PVC (50-200 μ g/ml) in neutral physiological saline concns. in lung fibroblast cultures and caused fluctuations in DNA concn. with little effect on total protein or RNA.

SS 10 /C?

USER:

PRINT FULL 1 SKIP 22

PROG:

23

AU - Frongia M
 AU - Spinazzola A
 AU - Bucarelli A
 TI - [Experimental pulmonary lesions caused by prolonged inhalation of PVC dust in work areas]
 SI - 10XNIB/26/010458
 SO - Ned Lav; VOL 65, ISS 9-10, 1974, P521-42
 LA - Ita

25

AU - UEJIMA T
 AU - YAKUMAKU K
 AU - ITO T
 AU - KONDO I
 AU - SAKAMOTO A
 AU - TAKITA K
 AA - Zen-Noh Agric. Tech. Cent., Hiratsuka, Kanagawa-Ken 254, Jpn.
 TI - Low volume application by fine dust formulations (FD formulations) as a new method for pest control in green house.
 SI - HEEP/77/05678
 SO - J PESTIC SCI; 1 (2), 1976 123-130
 AB - HEEP COPYRIGHT: BIOL ABS. A new method, low volume application by fine dust formulations in green houses was developed. The formulations, whose mean diameters were under 5 μ m, were applied at the rate of 300-500 g/10a (acre) from the green house entrance by a knapsack-type power applicator. Fine dust applied had good floating ability and was deposited in a large amount even on the back of plant leaves. The application showed flat diffusion of dust in green houses having areas of 200 m² and 1000 m². Polyvinyl chloride film as covering material was contaminated only slightly. Application time per 10a was about 5 min. Application of diazinon fine dust formulation (a.i. (active ingredient) 20%) at 500 g/10a gave 100% mortality against Myzus persicae of egg-plant in the large green house. Application of chlorothalonil fine dust formulation (a.i. 30%) at 500 g/10a resulted as good a control as application of chlorothalonil wettable powder in Colletotrichum blight of cucumber in the large green house.

SAL 000047803

SS 10 /CT/
USER:
PRINT FULL 2 SKIP 29
PROG:

30
AU - RICHARDS RJ
AU - DESAI R
AU - HEXT PM
AU - ROSE FA
TI - BIOLOGICAL REACTIVITY OF PVC DUST
SI - EMIC/76/020258
SO - NATURE(LONDON); 256:664-665, 1975
AB - EMIC/DRNL POLYVINYL CHLORIDE; MAMMAL CELL CULTURE; LUNG CELLS;

31
AU - Richards RJ
AU - Desai R
AU - Hext PM
AU - Rose FA
TI - Biological reactivity of PVC dust.
SI - TOXBIB/75/216541
SO - Nature; VOL 256, ISS 5519, 1975, P664-5
LA - Eng

HELLO FROM ELHILL 3.
YOU ARE NOW CONNECTED TO THE MEDLINE FILE.
ARE YOU AN EXPERIENCED USER? (YES/NO)

USER:
Y
PROG:

SS 1 /C?

USER:
FILE RTECS
PROG:

YOU ARE NOW CONNECTED TO THE RTECS FILE.

SS 1 /C?

USER:
(RN) 9002-86-2
PROG:
SS (1) PSTG (1)

SS 2 /C?

USER:
PRT DL COMPLETE INDENTED
PROG:

SOURCE IDENTIFICATION	NIOSH/KV0350000
PRIME NAME	ETHYLENE, CHLORO-, POLYMER
CAS REGISTRY NUMBER	9002-86-2
CLASS OF COMPOUND	CARCINOGEN
TOXICOLOGY/CANCER REVIEW	CARCINOGENIC DETERMINATION:INDEFINITE IARC** IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man. 7,311,74
TOXICOLOGY/CANCER REVIEW	TOXICOLOGY REVIEW AOHYA3 Annals of Occupational Hygiene. 17(2),143,74//JOCMA7 Journal of Occupational Medicine. 15(10),808,73//STRAAA Strahlentherapie. 100,192,56
SYNONYMS	BAKELITE
SYNONYMS	BLACAR

SAL 000047805

SYNONYMS	BOLTARON
SYNONYMS	BREON
SYNONYMS	CARINA
SYNONYMS	CHLOROETHYLENE POLYMER
SYNONYMS	CORVIC
SYNONYMS	DACOVIN
SYNONYMS	DECKOR
SYNONYMS	EKAVYL
SYNONYMS	ETINOX
SYNONYMS	FLAMENOL
SYNONYMS	FLOVIC
CONTINUE PRINTING? (YES/NO)	

USER:

Y

PROG:

SYNONYMS	GEON
SYNONYMS	HALVIC
SYNONYMS	HOSTALIT
SYNONYMS	KAYLITE
SYNONYMS	KAYREX
SYNONYMS	KOROSEAL
SYNONYMS	LACQVYL
SYNONYMS	LUCOFLEX
SYNONYMS	LUCOVYL
SYNONYMS	MARVINOL
SYNONYMS	NIACET
SYNONYMS	NORVINYL
SYNONYMS	OPALON
SYNONYMS	PEVIKON
SYNONYMS	PLIOFLEX
SYNONYMS	PLIOVIC
SYNONYMS	POLYVINYLCHLORID (German)
SYNONYMS	POLYVINYL CHLORIDE
SYNONYMS	PVC
SYNONYMS	QUIRVIL
SYNONYMS	RAVINYL
SYNONYMS	RHODOPAS
SYNONYMS	RHOVYL
SYNONYMS	RUCOBLEND
SYNONYMS	RYERTEX-OMICRON
SYNONYMS	SCON
CONTINUE PRINTING? (YES/NO)	

USER:

Y

PROG:

SYNONYMS	SEILON PVC
SYNONYMS	SICRON

SAL 000047806

SYNONYMS	TPC
SYNONYMS	UPALON
SYNONYMS	VESTOLIT
SYNONYMS	VINNOL
SYNONYMS	VINOFLEX
SYNONYMS	VINYL CHLORIDE POLYMER
SYNONYMS	VINYLITE
SYNONYMS	VIPLA
SYNONYMS	VIPLAVIL
SYNONYMS	UYBAK
SYNONYMS	UYCELL
SYNONYMS	UYGEN
SYNONYMS	UYRAM
SYNONYMS	UYRON
SYNONYMS	YARDLEY
MOLECULAR FORMULA	(C2-H3-Cl)n
CHEMICAL DEFINITION	Polymers with molecular weights ranging from 60,000-150,000 CNREA8 Cancer Research. 15,333,55
TOXIC DATA SOURCE	CNREA8 Cancer Research. 15,333,55
TOXDATA KEYWORDS	IMPLANT;RAT;RODENTS;TDLo;100 mg/kg ;TOXIC EFFECTS;NEOPLASTIC

SS 2 /C?

USER:

FILE TOXLINE

PROG:

YOU ARE NOW CONNECTED TO THE TOXLINE FILE.

SS 1 /C?

USER:

(RN) 9002-86-2

PROG:

SS (1) PSTG (658)

SS 2 /C?

USER:

(KW) PVC OR POLYVINYL AND CHLORIDE

PROG:

SS (2) PSTG (293)

SS 3 /C?

USER:

TS (T1\I) :PVC: OR :POLYVINYL CHLORIDE:

PROG:

(56) SCHD (47) QUAL; CONT? (Y/N)

USER:

Y

PROG:

(115) SCHD (93) QUAL; CONT? (Y/N)

SAL 000047807

USER:
Y
PROG:
(166) SCHD (121) QUAL; CONT? (Y/N)

USER:
Y
PROG:
(217) SCHD (161) QUAL; CONT? (Y/N)

USER:
Y
PROG:
(268) SCHD (201) QUAL; CONT? (Y/N)

USER:
Y
PROG:
SS (3) PSTG (221)

SS 4 /C?
USER:
1 AND NOT 2
PROG:
SS (4) PSTG (536)

SS 5 /C?
USER:
2 AND NOT 1
PROG:
SS (5) PSTG (171)

SS 6 /C?
USER:
1 AND ALL REVIEW#
PROG:
TIME OVFLW: CONT? (Y/N)

USER:
Y
PROG:
SS (6) PSTG (17)

SAL 000047808

SS 7 /C?
USER:
PRT 17 TI
PROG:

1
: TI - Environmental considerations in manufacturing, using, and

1

TI - Environmental considerations in manufacturing, using, and disposing of PVC materials and products

2

TI - Problems of packing fats. III. Problem of plastics toxicity

3

TI - Safety evaluation of medical plastics

4

TI - PVC: health implications and production trends

5

TI - Vinyl chloride and poly(vinyl chloride) health risks. A select bibliography

6

TI - PVC in the packaging of pharmaceutical and food products: technology, analysis, and uses

7

TI - Effect of new sterilization methods on the properties of some plastics used in medicine

8

TI - Polyvinylchloride plastics - the enemy within?

9

TI - Origin of cancer in PVC-workers

10

TI - Scientific and technical assessment report on vinyl chloride and polyvinyl chloride

11

TI - Vinyl chloride problem

12

TI - Determination of vinyl chloride in PVC processing plants

13

TI - Vinyl chloride toxicity. Current knowledge

14

TI - REVIEW OF TESTS FOR CARCINOGENICITY AND THEIR SIGNIFICANCE TO MAN

15

TI - A new type of occupational malignant neoplasms induced by vinyl chloride: Review of literature.

16

TI - SPECIAL REQUIREMENTS FOR PLASTIC DEVICES

17

TI - Toxicity of plasticizers in poly(vinyl chloride)

SS 7 /C?

USER:

1 OR 2

PROG:

SS (7) PSTG (829)

SS 8 /C?

USER:

7 AND ALL REVIEW#

PROG:

TIME OVFLW: CONT? (Y/N)

USER:

Y

PROG:

SS (8) PSTG (23)

SS 9 /C?

USER:

7 AND ALL SURVEY

PROG:

SS (9) PSTG (11)

SS 10 /C?

USER:

7 AND ALL BIBLIOGRAPH:

PROG:

SS (10) PSTG (3)

SS 11 /C?

USER:

8 OR 9 OR 10

PROG:

SS (11) PSTG (36)

SS 12 /C?

USER:

PRT 36

PROG:

1

AU - Guess WL

TI - Safety evaluation of medical plastics.

SI - TOXBIB/78/126117

SD - Clin Toxicol; VOL 12, ISS 1, 1978, P77-95 (REF: 31)

2

SAL 000047810

2

AU - Beissert JD
AU - Herbert J
TI - Health hazard evaluation determination report number 76-29-322,
Columbus Products Corporation, Columbus, Ohio
SI - CA/088/157778Z
SO - U. S. NTIS, PB Rep.; ISS PB-273706,, 1976,17 pp.

3

AU - Crider LB
AU - Holbrook WC
AU - Kent DL
TI - ~~Environmental considerations in manufacturing, using, and~~
~~disposing of PVC materials and products~~
SI - CA/088/125880K
SO - Encycl. PVC; VOL 3,, 1977,1725-54

4

AU - Derache R
TI - Problems of packing fats. III. Problem of plastics toxicity
SI - CA/088/115840H
SO - Rev. Fr. Corps Gras; VOL 24, ISS 12, 1977,607-10

5

AU - Guess WL
TI - Safety evaluation of medical plastics
SI - CA/088/094690S
SO - Clin. Toxicol.; VOL 12, ISS 1, 1978,77-95

6

AU - Karstadt M
TI - PVC: health implications and production trends
SI - CA/088/011100A
SO - Environ. Health Perspect.; VOL 17,, 1976,107-15
CONTINUE PRINTING? (YES/NO)

USER:

Y

PRDG:

7

AU - Ohtsuki K
AU - Nakane M
AU - Sakai K
AU - Horino M
AU - Oikawa R
TI - Survey of hazardous compounds in domestic materials. Part 2
SI - CA/088/059021C
SO - Miyagi-ken Eisei Kenkyusho Nempo; 1976,01-4

8

AU - Walker JR A

SAL 000047811

TI - Vinyl chloride and poly(vinyl chloride) health risks. A select
bibliography
SI - CA/087/105971S
SO - Tech. Bibliogr. - Birmingham Public Libr.; VOL 1, 1976, 17 pp.

9

AU - Galli A
AU - Zanotti Gerosa A
TI - PVC in the packaging of pharmaceutical and food products:
technology, analysis, and uses
SI - CA/087/206391H
SO - Boll. Chim. Farm.; VOL 116, ISS 5, 1977, 285-99

10

AU - De Voogd P
TI - World wide approach to the PVC problem. Overall drastic
reduction of standards
SI - CA/087/033961P
SO - Ned. Chem. Ind.; VOL 19, ISS 8, 1977, 179-83

11

AU - Zabojszcz W
TI - Effect of new sterilization methods on the properties of some
plastics used in medicine
SI - CA/086/145808E
SO - Probl. Tech. Med.; VOL 7, ISS 4, 1976, 283-8
CONTINUE PRINTING? (YES/NO)

USER:

Y

PROG:

12

AU - Bell FP
TI - Polyvinylchloride plastics - the enemy within?
SI - CA/086/115671N
SO - Artery (Leonidas, Mich.); VOL 2, ISS 5, 1976, 384-9

13

AU - Norpoth K
TI - Origin of cancer in PVC-workers
SI - CA/086/066255U
SO - Umsch. Wiss. Tech.; VOL 76, ISS 21, 1976, 684-6

14

AU - Pervier JW
AU - Barley RC
AU - Field DE
AU - Friedman BM
AU - Morris RB
TI - Survey reports on atmospheric emissions from the petrochemical

SAL 000047812

Industry. Volume IV

- SI - CA/084/168929T
- SO - U. S. NTIS, PB Rep.; ISS PB-245630,, 1974,287 pp.

15

- TI - Scientific and technical assessment report on vinyl chloride and polyvinyl chloride
- SI - CA/084/126090G
- SO - U. S. Environ. Prot. Agency, Off. Res. Dev., [Rep.] EPA; ISS EPA-600/6-75-004,, 1975,116 pp.

16

- AU - Huber H
 - TI - Vinyl chloride problem
 - SI - CA/084/064636D
 - SO - Chem.-Ing.-Tech.; VOL 47, ISS 19, 1975,803-7
- CONTINUE PRINTING? (YES/NO)

USER:

Y

PRG:

17

- AU - Ketterer PA
- TI - Determination of vinyl chloride in PVC processing plants
- SI - CA/084/049300W
- SO - Tech. Pap., Reg. Tech. Conf., Soc. Plast. Eng., Palisades Sect.; ISS Oct. 31-Nov. 1, 1974,163-71

18

- AU - Foa V
- AU - Bertazzi PA
- TI - Vinyl chloride toxicity. Current knowledge
- SI - CA/084/034711G
- SO - Med. Lav.; VOL 65, ISS 11-12, 1974,401-20

19

- AU - Okawa MT
- TI - Health hazard evaluation/toxicity determination report H.H.E. 75-120-220, Storm Products Company, Palo Alto, California
- SI - CA/085/181688D
- SO - U. S. NTIS, PB Rep.; ISS PB-249400,, 1975,5 pp.

20

- AU - Norgren M
- TI - The vinyl chloride problem: the ever producing PVC industry
- SI - CA/085/009762W
- SO - Tek. tidskr.; VOL 106, ISS 1-2, 1976,24-5

21

- AU - Stetson JB

SAL 000047813

AU - Autian J
TI - Necrotizing enterocolitis and plastic catheters. pp. 79-98.
SI - TOXBIB/77/095107
SO - In: Stern L, et al., ed. Intensive care in the newborn. New York, Masson, 1976. WS 420 1601 1975. (REF: 81)

22

AU - Reamer JT
AU - Grady LT
AU - Shangraw RF
AU - Mehta AM
TI - Moisture permeation of typical unit dose repackaging materials
SI - IPA/77/01092
SO - Am. J. Hosp. Pharm.; VOL 34 ISS Jan 1977, P35-42, (REF 7)
CONTINUE PRINTING? (YES/NO)

USER:

Y

PROG:

23

AU - Andrasch RH
AU - Bardana EJ Jr
AU - Koster F
AU - Pirofsky B
TI - Clinical and bronchial provocation studies in patients with meatwrappers' asthma.
SI - TOXBIB/76/238160
SO - J Allergy Clin Immunol; VOL 58, ISS 2, 1976, P291-8

24

AU - Brevik EM
TI - [Toxicity of the PVC-plasticizer di(2-ethylhexyl)phthalate (author's transl)]
SI - TOXBIB/76/221842
SO - Nord Vet Med; VOL 28, ISS 4-5, 1976, P226-32

25

AU - Oba T
AU - Suzuki Y
AU - Omori Y
AU - Kuwamura T
AU - Yamaha I
TI - [Safety of phthalic acid esters--especially DEHP--, plasticizer of polyvinyl chloride for medical devices (author's transl)]
SI - TOXBIB/76/162042
SO - Bull Natl Inst Hyg Sci (Tokyo), ISS 93, 1975, P1-25 (REF: 135)

26

AU - Falk H
AU - Portnoy B

PROG:

27

AU - Warren H
AU - Huff JE
TI - Health effects of vinyl chloride monomer: an annotated literature

SAL 000047814

TI - Respiratory tract illness in meat wrappers.
SI - TOXBIB/76/098130
SO - JAMA; VOL 235, ISS 9, 1976, P915-7
CONTINUE PRINTING? (YES/NO)

USER:

Y

PROG:

27

AU - Warren H

AU - Huff JE

TI - Health effects of vinyl chloride monomer: an annotated literature collection.

SI - TOXBIB/76/022261

SO - Environ Health Perspect; VOL 11, 1975, P251-319

28

AU - Carpenter BH

TI - Vinyl chloride. Assessment of emissions control techniques and costs

SI - CA/082/159850S

SO - U. S. N. T. I. S., PB Rep.; ISS No. 237343/96A,, 1974,85 pp.

29

AU - GRASSO P

TI - REVIEW OF TESTS FOR CARCINOGENICITY AND THEIR SIGNIFICANCE TO MAN

SI - HEEP/77/08722

SO - CLIN TOXICOL; 9 (5). 1976 745-760

30

AU - SHABAD LM

AU - GENIN VA

TI - A new type of occupational malignant neoplasms induced by vinyl chloride: Review of literature.

SI - HEEP/77/05642

SO - BIG TR PROF ZABOL; (7). 1976 41-44

31

AU - ANDRASCH RH

AU - BARDANA E J JR

AU - KOSTER F

AU - PIROFSKY B

TI - Clinical and bronchial provocation studies in patients with meatwrappers' asthma.

SI - HEEP/77/03638

SO - J ALLERGY CLIN IMMUNOL; 58 (2). 1976 291-298

CONTINUE PRINTING? (YES/NO)

USER:

Y

SAL 000047815

PRUG:

32

AU - FALK H
AU - PORTNOY B
TI - Respiratory tract illness in meat wrappers.
SI - HEEP/76/08570
SO - JAMA (J AM MED ASSOC); 235 (9). 1976 915-917

33

AU - HEIMANN H
AU - LILIS R
AU - HAWKINS DT
TI - A BIBLIOGRAPHY ON THE TOXICOLOGY OF VINYL CHLORIDE AND POLYVINYL
CHLORIDE.
SI - HEEP/75/09617
SO - ANN N Y ACAD SCI; 246. 1975 322-337

34

AU - BISCHOFF F
AU - BRYSON G
TI - SPECIAL REQUIREMENTS FOR PLASTIC DEVICES
SI - HEEP/75/00915
SO - ACTA ENDOCRINOL SUPPL; 185. 1974 296-314

35

AU - King S
TI - Toxicity of plasticizers in poly(vinyl chloride)
SI - CA/083/126971Z
SO - Hua Hsueh Tung Pao; ISS 5, 1974, 316-19

36

AU - Germano A
AU - Lorenzi E
AU - Calvo B
AU - Guerra F
TI - Packaging in heat-sealable materials, and the stability of drugs
SI - CA/083/033004W
SO - Boll. Chim. Farm.; VOL 113, ISS 10, 1974, 513-31

SS 12 /C?

USER:

TS 2 (TI) :PVC TOXICITY: OR :POLYVINYL CHLORIDE TOXICITY:

PRUG:

(56) SCHD (0) QUAL; CONT? (Y/N)

USER:

Y

PRUG:

(115) SCHD (2) QUAL; CONT? (Y/N)

SAL 000047816

USER:
Y
PRG:
(166) SCHD (3) QUAL; CONT? (Y/N)

USER:
Y
PRG:
(217) SCHD (4) QUAL; CONT? (Y/N)

USER:
Y
PRG:
(268) SCHD (4) QUAL; CONT? (Y/N)

USER:
Y
PRG:
SS (12) PSTG (4)

SS 13 /C?

USER:
PRT 4
PRG:

1
AU - Dyer RF
AU - Esch VH
TI - Polyvinyl chloride toxicity in fires. Hydrogen chloride toxicity
in fire fighters
SI - CA/084/116515K
SO - J. Am. Med. Assoc.; VOL 235, ISS 4, 1976,393-7

2
AU - Dyer RF
AU - Esch VH
TI - Polyvinyl chloride toxicity in fires: hydrogen chloride toxicity
in fire fighters
SI - IPA/76/03588
SO - J. Am. Med. Assoc.; VOL 235 ISS Jan 26 1976, P393-397, (REF 10)

3
AU - Dyer RF
AU - Esch VH
TI - Polyvinyl chloride toxicity in fires. Hydrogen chloride toxicity
in fire fighters.
SI - TOXBIB/76/098082
SO - JAMA; VOL 235, ISS 4, 1976, P393-7

4
AU - DYER RF

SAL 000047817

SI - ESCH VH
SI - Polyvinyl chloride toxicity in fires: Hydrogen chloride toxicity
in fire fighters.
SI - HEEP/76/06831
SD - JAMA (J AM MED ASSOC); 235 (4). 1976 393-397

SS 13 /C?

USER:

STOP

TIME 0:18:35 NLN TIME 11:53:21

USER.

PROG:

DONE? (YES/NO)

USER:

Y

PROG:

GOOD-BYE!

SAL 000047818

J-PVC

1. Agarwal D K, Srivastava S P, Seth P K (1977).
Effect of polyvinyl chloride dust on rat lung.
In Environmental Pollution and Human Health, 282-291.
Proceedings of the International Symposium on Industrial
Toxicology. Nov 4-7 1975. Ed. S H Zaidi. Publ INSOC.
2. Arnaud A, Pommier P, Garbe S L, Payan H, Charpin J (1978).
Polyvinyl chloride pneumoconiosis. Thorax 33 19-25.
3. Baxter P J, Fox A J (1976).
Angiosarcoma of the liver in PVC fabricators.
Lancet 1 (7953) 245-6.
4. Bell F P (1976).
Polyvinyl chloride plastics. The enemy within?
Artery 2(5) 384-389.
5. Casterline, CL, Casterline P P, Jaques D A (1977).
Squamous cell carcinoma of the buccal mucosa associated
with chronic oral polyvinyl chloride exposure.
Cancer 39 1686-8.
6. Cylwik B (1972).
Histological and histochemical changes in liver during
experimental PVC pneumoconiosis.
(Roczn Akad Med Bialymstoku 17 93-11 1972).
Chem Abstr 78 67842 (1973).
7. Duck B W et al (1975).
Mortality study of workers in a polyvinyl chloride
production plant.
Lancet II (7946) 1197-1199.
8. Dvizkhov P P (1960).
Occupational Cancer.
Gigiena Truda Prof Zabol 4 3.
- * 9. Dvoskin Ya G et al (1969).
Toxicology of some polymers.
(Gig Sanit 34 (1) 7-11 1969).
Chem Abstr 70 85812.
10. Filatova V S et al (1974).
Hygienic assessment of working conditions and health
status of workers in the production of block polyvinyl
chloride.
Gig Tr Prof Zabol 19(1) 3-6.
11. Filatova V S, Grensberg Ye Sh (1957).
Sanitary hygienic conditions of work in the production
of polychlorovinyl resin and measures for their improvement.
Gig Sanit 22(1) 32-42.

12. Frongia R, Spinazzola A, Bonarelli A (1974).
Experimental pulmonary lesion: effect prolonged
of PVC dust in a work environment.
Med Lav 65(9-10) 320-.
- * 13. Gabor S et al (1964).
Biochemical changes in workers occupied in vinyl chloride
synthesis and polymerisation.
(Igiene 13 409-18 1964).
Chem Abstr 62 9683h (1965).
- * 14. Harris D K (1962).
Health and safety in the plastics industry.
Plastics Inst Trans 30 No 86 328.
15. Hodgson G A (1966).
Industrial dermatitis.
Postgrad Med J 42 643-651.
16. Karstadt H (1976).
PVC : Health implications and production trends.
Environ Hlth Perspect 17 107-115.
US Department of Health Education and Welfare NHO-NIEHS
Symposium on Plastics Manufacture.
17. Lange C-E, Juhe S, Stein G, Veltman G (1975).
Further results in polyvinyl chloride production workers.
Annals NY Acad Sci 246 18-21.
18. Lilis R, Anderson H, Miller A, Selikoff I J (1976)
Pulmonary changes among vinyl chloride polymerisation
workers.
Chest 69 18th Aspen Conference.
19. Lilis R, Anderson H, Nicholson W J, Datta S, Fishbein A S,
Selikoff I J (1975).
Prevalance of disease among vinyl chloride and polyvinyl
chloride workers.
Annals NY Acad Sci 246 22-41.
20. McGinty L (1975).
PVC dust kills factory mice suggesting new work hazard.
New Scientist 26.6.75 714.
21. Miller A, Teirstein A S, Chuang K, Selikoff I J, Marshaw R (1975).
Changes in pulmonary function in workers exposed to vinyl
chloride and polyvinyl chloride.
Annals NY Acad Sci 246 42-52.
22. Misgeld V et al (1973).
On intoxication via vinyl chloride polymerisates and/or
their accompanying substances.
Z Haut Geschlechtskr 50 428-436.

23. Parmeggiani L, Sassi C (1966).
Occupational risk and pathology in the production and manipulation of some plastic material.
(Med Lav 46:14)
Chem Abstr 49 9317h 1955.
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Effect of PVC dust on the respiratory system of the rat.
(Rocz Akad Med Bialystoku (Suppl 24) 5-48)
Chem Abstr 74 74463 (1971).
26. Richards R J, Desai R, Hext P H, Rose F A (1975).
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Nature 256 (5519) 654-5.
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Malignant tumors of the liver and lungs in an area with a PVC industry.
Environ Hlth Perspect 17 189-192.
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Pneumoconiosis due to inhalation of PVC powder.
(Med Lav 61 433-436)
Excerpta Med Occup Hlth & Ind Med 1 (12) 2366 (1971).
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PVC and Safety. European Regulations
Caout Plast 54 (571) 33-38.
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On the state of the broncho-pulmonary system in workers engaged in the manufacture of polyvinyl chloride products.
Gig Truda prof Zabol 14 29-32.
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AMA Arch Industr Hlth 21 536.

35. Encyclopedia of Occupational Health and Safety, Geneva.
ILO 1971 2 1467.

36. Preliminary assessment of the environmental problems
associated with vinyl chloride and polyvinyl chloride.
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37. Vinyl Chloride, PVC, and cancer.
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38. *Functional Respiratory Changes upon Chronic Exposure to Monomers
of Polymeric Vinyl Chloride.*

Med. Lav. Vol 69 No 2 1976 p. 151-162 (Translation by BP Chemicals Ltd)

*C. Napp, J. Fallois, A. Rossi, G. Morro & G. Basso
(Institute of Industrial Medicine - University of Padua)*