

BIOASSAY STUDIES OF THE TOXICITY OF A VINYL CHLORIDE-VINYLDENE CHLORINE MIXED
POLYMER AND TWO SUBSTANCES WHICH CAN BE USED TO STABILIZE DISPERSIONS

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German Central Institute for Occupational Medicine
Institute for Occupational Hygiene

TRANSLATION OF:

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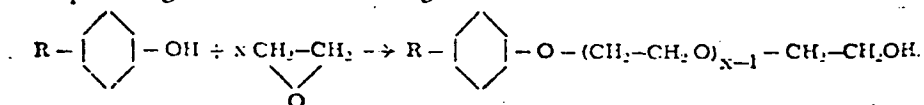
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Paper is a cheap and ideal packing material, because it possesses good mechanical properties and it is easily worked. Its undesirable features include low resistance to moisture and grease, and in many cases its transparency to water vapor and gases. Hence, products which retain the valuable properties of paper but correct these shortcomings have aroused the interest of the paper industry. Among these products, dispersions play a special role, in which the plastic is finely distributed in water. After the water evaporates, a film remains which protects the paper against the action of moisture and makes it non-transparent to gases and water vapor.

The plastics that have been suitable for this purpose include in particular the copolymers of vinylidene chloride. These copolymers are interesting because they form continuous films without the addition of plasticizers at room temperature or slightly above. The films are characterized by resistance to water, grease, oil, mild acids or alkalis and resistance to water vapor and gas. Satisfactory cost and easy working have facilitated the introduction of these products. Coated papers are used for packing margarine, dehydrated soup and other food. In addition, disposable packages such as pails and cartons can be impregnated.

In addition to the plastics, the dispersions contain primarily emulsifiers and frequently adjuvants as well which further stabilize the dispersions. Emulsifiers include alkyl sulfonate or alkyl aryl sulfonate. Non-ionogenic compounds are frequently used as stabilizers.

These constitute adducts of ethylene oxide on alkyl phenol or fatty alcohol, corresponding to the following formula:



In the German Democratic Republic, a mixed polymer composed of vinyl chloride and vinylidene is used for coating papers of diverse kinds, as well as putty or sealer. 0.5% of an adduct of ethylene oxide on fatty alcohol, called "stabilizer L", is added to this mixed polymer as a stabilizer.¹

The only published studies on mixed polymers that have appeared thus far have been in the work of Thamm who conducted a study to determine whether

¹ I am indebted to Dr. Muelsteph, Factory Manager of VEB Chemische Werke Buna for information regarding the chemistry of the substances and their applications.

Vinitex 50 is suitable as a floor coating for stalls. He found no pathological changes in hogs when the latter were exposed to Vinitex.

Feeding 100 mg of Vinitex containing 1.5% stabilizer L to three rabbits for three weeks produced a reduced average weight gain in comparison with the control animals, with the latter gaining an average of 280 grams and one of the three experimental animals showing a weight gain of 300 grams. On the histological level, he saw changes in the liver, spleen and kidneys, among both the animals which had received Vinitex with stabilizer L and in another test group, but somewhat more pronounced in the former. From this Thamm concluded that Vinitex with stabilizer L "when taken into the body orally over a long period of time causes injury."

As a result of the test with stabilizer L, Thamm states "that this substance given in amount of 20430 mg/kg of body weight to hogs and rabbits, regularly causes interstitial nephritis, subacute hepatitis, and destruction with considerable loss of chromaffinic substance in the cortex of the adrenals." Unfortunately, the article says nothing about the method of investigation or the number of animals studied.

We were asked by the manufacturer to investigate the mixed polymer and the stabilizer using another animal species. We were also supposed to check whether the product known as FA, an adduct of ethylene oxide on alkylphenol, was possibly preferable to stabilizer L from the standpoint of toxicology.

In determining the method of investigation to be used, we proceeded on the basis of the fact that man can come in contact with the substance as follows:

1. Skin contact.
2. Possible intake into the body through the skin.
3. Intake through the digestive tract.

For this reason, our bioassay experiments on rats included a determination of possible injury caused by skin contact in the upper layers of the skin itself, through possible skin resorption and intake through the digestive tract.

To check skin tolerance, we painted the previously shaved dorsal skin with the substance twice a day for two weeks in groups of ten experimental animals each. Another group of six animals served as a control. We observed the local changes in the general behavior of the animals. After the observation period was over, the experimental and control animals were killed and their organs examined macroscopically and microscopically.

For the skin resorption test, we established a dilution series of substances with concentrations between 25% and 100%. Groups of ten experimental and two control animals each were placed in an experimental apparatus which dipped the entire length of the rats' tails in the solution. The duration of the experiment was 50 hours.

The approximate lethal dose was determined according to the method of Teichmann and Le Blanc with doses of 1.4 to 24 grams per kilogram of body weight (g/kg). In order to detect possible injury caused by intake of the substances over a long period of time, we gave the substances orally in doses of 0.25 g,

0.5 g and 1.0 g/kg to groups of 15 animals each over a period of seven weeks. In the case of stabilizer L, we also performed an experimental series with a dose of 50 mg/kg, an amount which is approximately ten times the concentration which comes in contact with margarine when the latter is packed as a cube weighing 250 grams, and performed both a histological and a histochemical study, which are described elsewhere in detail.²

RESULTS OF THE INVESTIGATION

1. Vinitex without stabilizer L and Vinitex with 0.5% stabilizer L.

The skin of the painted animals did not change. Only a slight scratching effect developed during the test, the consequence of an itch evidently caused by the substance, which quickly disappeared after the test was over without any trace. Otherwise, the animals showed no characteristics that differed on either macroscopic or microscopic levels from the control animals.

The study of the cutaneous resorption also failed to show any pathological findings.

The determination of the approximate lethal dose showed that both substances, given once, are nontoxic, since the animals tolerated 24 g/kg quite well (converted to a 70 kg man, this would be 1680 grams), and showed no malignant changes in autopsy.

Likewise, those animals which had the substance administered orally once a day over a long period of time did not differ remarkably in their behavior or in the results of their macroscopic and microscopic examination from the control animals.

Vinitex and Vinitex with stabilizer L proved to be completely harmless in the bioassay. The fact that we came to different conclusions than Thamm is probably due to the change in the dose (reduction of the stabilizer L amount from 1.5% to 0.5%).

2. Stabilizer L.

The skin painting was tolerated well by the animals. The autopsy treated in this fashion revealed no pathological findings. The resorption test was also negative. Neither the tails of the animals nor the macroscopic and microscopic study following the end of the experiment showed any changes that would distinguish them from the control animals.

In determining the approximate lethal dose, all the animals died which received more than 10.7 g/kg within 24 hours. Since 10.7 g/kg would be a dose of

²I should like to thank the Toxicological Laboratory at the Institute for Occupational Hygiene of the German Central Institute for Occupational Medicine for their help in performing the studies.

749 grams for a 70 kg man, we can see that stabilizer L is practically nontoxic in an acute test.

In an oral application extending over seven weeks, 30% of the animals died which received 0.25 g and 0.5 g/kg, and 60% of the animals which we gave 1.0 g/kg, during the experimental period. Autopsy revealed a coarsening of the lobe structure, foci of fatty degeneration and numerous cellular infiltrates in the liver. The average weight gain of the surviving experimental animals was significantly below that of the control animals.

The animals that received 50 mg/kg all survived and on the average developed normally in comparison with the control animals. The autopsy following the end of the experimental series revealed no findings on the macroscopic or microscopic level that were different from those in the control animals.

In conclusion, we can say that skin contact with stabilizer L, even over a long period of time, or a single oral intake of the substance, or even an enteral application of small doses over a long period of time causes no danger to health.

The daily administration of 0.25 g/kg body weight or more through the gastrointestinal tract could definitely cause danger to health.

3. Product FA

The painted skin of the animals was dry and brittle beginning on the fourth day of the experiment. The shape of the weight curve was much less satisfactory than that of the control animals. Since autopsy revealed no details to clarify this fact, we interpret this as a consequence of the influence of the dry-brittle skin on the general condition of the animals (appetite, etc.).

In the skin resorption test the tails of the animals became more red in the course of the experiment. However, we failed to find any other changes that were different from the control animals, either during the experiment or in the following autopsy. The approximate lethal dose as determined by the method of Teichmann and Le Blanc was 7.0 g/kg. However, after 96 hours even those animals which had received 5.5 g and 4.7 g/kg died.

Feeding 0.25 g/kg body weight daily over a period of seven weeks was survived by all animals; at 0.5g and 1.0 g/kg body weight, 20% died during the test. Autopsy revealed changes in the liver, in the form of a fatty degeneration and numerous cellular infiltrates as symptoms of inflammation.

Since we were requested by the manufacturer to decide whether product FA was preferably to stabilizer L from the toxicological standpoint, we compiled the research results of these two substances in the following table:

TABLE

Experiment	Stabilizer L	Product FA
Skin contact	Weight gain of 10-25 g	Either no weight gain or a weight loss of 15-40 g
	No skin changes	Brittle and dry skin
Skin resorption test	No change	Reddening of the rats' tails
Approximate lethal dose	10.7 g/kg	7.1 g/kg
Oral application over 7 weeks	0.25 g and 0.5 g/kg 30% 1.0 g/kg 60% of the animals	Died at: 0.25 g/kg 0% 0.5 g and 1.0 g/kg 20% of the animals

We can see from the comparison in the table that from the toxicological standpoint the use of product FA instead of stabilizer L would bring no advantages, since the more favorable results obtained with oral administration over a long period of time are offset by the less favorable approximate lethal dose and the poorer skin tolerance.

CONCLUSIONS

A bioassay using rats was used to study the toxicity of Vinitex (mixed polymer of vinyl chloride and vinylidene chloride), stabilizer L (70% aqueous solution of an alkyl phenol, to which ethylene oxide groups had been added) and product FA (40% aqueous solution of an hydroxyethylated fatty alcohol).

Vinitex without stabilizer L and Vinitex with 0.5% stabilizer L are practically nontoxic.

In the case of stabilizer L, skin contact, single oral administration of even large amount and long-term oral administration of small doses failed to produce any damage to health. Repeated administration of 0.25 g/kg or more can be expected to produce injury.

Product FA causes skin changes following frequent contact. It is less toxic when taken once through the gastrointestinal tract, but repeated intake of 0.5 g/kg or more causes damage to health.

Replacement of stabilizer L by product FA offers no advantages from the toxicological standpoint.

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Poland). *Gaz. Woda Tech. Sanit.* 38(10), 336-9(1964)(Pol). Waste waters from the production of CH_2CHCl and from its polymerization by both emulsion and suspension methods are considered. Sewage from CH_2CHCl production contained C_2H_4 , <2.5, HCl 15-80, aldehydes <1, and CH_2CHCl 100-400 mg./l. Sewage from emulsion and suspension polymerization plants had, resp.: pH 6-7 and 8; dry residue 1.0-10.0 and 8.8, CH_2CHCl 0.5-9.0 and 1.3, and surface-active agents 0.02-0.2 and 6.6 g./l.; oxidizability 0.1-0.5 and 2.0, chem. O demand 0.2-2.0 and 8.8, and B.O.D. 0.1-0.5 and 2.0 g. O/l. It was found that polymerized CH_2CHCl is most efficiently removed by coagulation and sedimentation. Optimum dose of coagulant $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ for sewage from suspension polymerization is 0.1-1.0 g./l. For sewage from emulsion polymerization thermal coagulation is advisable. Irena Kloczko

Characteristics and purification of waste waters from production of vinyl resins. Boleslaw Kotulski (Zaklady Chem., Oswiecim, Poland). *Gaz. Woda Tech. Sanit.* 39(2), 46-9(1965)(Pol). The phys.-chem. characteristics and toxicity for living organisms (*Daphnia magna*) were studied for waste waters from the production of monomers and polymers of CH_2CHOAc (I) and CH_2CCl_2 . Sewage from the synthesis of I had pH ~4, O consumption ~500, chem. O demand ~19,000, and B.O.D. ~2000 mg. O/l., and a Zn content ~80 g./l. The sewage killed living organisms even when dild. 1:10000. The degree of pollution of other sewage studied was much greater. In coagulation with CaO and NaCl, the former was more efficient. The sewage from polymerization and copolymerization of CH_2CCl_2 contained many inorg. salts and had relatively low toxicity. Irena Kloczko

Role of hydroxides and carbonates in the flocculation and sedimentation during the clarification of sewage from viscose production. O. P. Sinev. *Dokl. X V-oi [Pyatnadsatsoi] nauchn. Konf. Novocherk. Politekhn. Inst. Stroit. Sekts., Novocherkassk* 1964, 75-6(Russ). $\text{Fe}(\text{OH})_3$, $\text{Zn}(\text{OH})_2$, $\text{Mg}(\text{OH})_2$, and CaCO_3 improved flocculation and sedimentation of hydrated cellulose, which in turn accelerated the hydrolysis of metal salts, coagulation of hydroxides, and crystn. of CaCO_3 . The optimum pH for the flocculation and sedimentation of suspended solids was 10.5-11.5. From *Ref. Zh., Khim.* 1964, Abstr. No. 231326.

Pilot plant denitration of Purex waste with sugar. E. A. Coppinger (Gen. Elec. Co., Richland, Wash.). AEC Accession No. 35243, Rept. No. HW-77080. Avail. OTS, 16 pp.(1963)(Eng). A plant flowsheet was developed and successfully demonstrated in pilot plant equipment. A 1.4M sugar soln. was added to 25 l. waste for 12 hr. at 100°, and the mixt. was digested for 18 hr. The initial HNO_3 concn. was 6.14M. The residual was 0.94 and 0.90M after 12 and 18 hr. of digestion, resp. A residual C content equivalent to 1.9 and 0.4% of the total C fed as sugar was present after 12 and 18 hr. of digestion, resp. About 19 moles HNO_3 were destroyed per mole of sugar fed. Foaming was produced during batch denitration with sugar by adding 0.4 g. dibutylphosphate/l. of synthetic waste. The addn. of 0.2 g. Dow-Corning Antifoam B/l. of waste reduced foam levels by about a factor of 2. An induction period of ~6-9 min. was observed before the reaction started. The length of the induction period increased as initial sugar addn. rates were reduced. Gentle air sparging reduced the induction period by about a factor of 2. The use NaNO_2 as a means of decreasing the induction period was not successful. Sugar soln. was added to cold waste, and the mixt. was heated to det. the pot pressures and tower pressure drops that could be developed under abnormal conditions. A decrease in pot vacuum of 30 in. H_2O and a tower pressure drop of 8 in. H_2O were observed when 20 l. of waste and 2.7 l. 2.5M sugar soln. were mixed together and rapidly heated to 100°. From *Nucl. Sci. Abstr.* 17(20), 4704(1963). TCNG

Report of invention-solvent extraction process for recovery of strontium, cerium, rare earths, and cesium from radioactive waste solutions. Lane A. Bray (Gen. Elec. Co., Richland, Wash.). AEC Accession No. 5988, Rept. No. HW-75537. Avail. OTS, 14 pp.(1962)(Eng). A solvent extn. process is described which removes Sr, Ce, Cs, and rare earths from acid solns. (pH 3-5) in 1 operation. The process is based on the use of a solvent composed of 4-sec-butyl-2-(α -methylbenzyl)phenol and bis(2-ethylhexyl)phosphoric acid in a diluent, such as Soltrol 170. Data are presented on the extn. of Sr, Ce, and Cs under varying conditions. From *Nucl. Sci. Abstr.* 19(4), 681-(1965). TCNG

Equipment for a counterflow sorption using natural sorbent suspensions. V. Vesely, I. Napravnik, S. Gaderka, M. Paar, and L. Mazel. AEC Accession No. 6879, Rept. No. UJV-1108/64. Avail. AEC, 14 pp.(1964)(Eng). A method for countercurrent sorption of radionuclides from aq. waste by using bentonite and tuff was developed on a lab. scale. The tuff showed relatively high extn. coeffs. esp. for Cs. Values for Sr were lower and depended on Ca ion concn. An industrial process carried out in conical-bottomed mixers is outlined. From *Nucl. Sci. Abstr.* 19(4), 792(1965). TCNG

Engineering development of nuclear waste pot calcination. M. E. Whatley, C. W. Hancher, and J. C. Suddath (Oak Ridge

Natl. Lab., Oak Ridge, Tenn.). *Chem. Eng. Progr., Symp. Ser.* 60(53), 32-40(1964)(Eng); cf. Buckham, et al., following abstr. The feeds investigated were TBP-25 solvent extn. waste, Darex waste, and conventional Purex formaldehyde-treated waste. The waste was concd. by evapn. and by steam-stripping of the HNO_3 . The concd. soln. was then introduced into the heated calciner pot where it was denitrated, brought to a solid cake, and calcined. The process is workable and safe.

Albert E. Nugent, Jr.
Development of fluidized bed waste calcination process. J. A. Buckham, L. T. Lakey, and J. A. McBride (Phillips Petrol. Co., Idaho Falls, Idaho). *Chem. Eng. Progr., Symp. Ser.* 60(53), 20-31(1964)(Eng); cf. Tomlinson, CA 60, 3866c. Allemann, et al., CA 60, 15584d, Whatley, et al., preceding abstr. A plant-scale, fluidized bed calcination process was constructed to utilize a totally continuous process for the conversion of aq., high-level radioactive wastes into compact granular solids. A feed soln. of $\text{Al}(\text{NO}_3)_3$ waste was injected into a heated bed of granular solids, such as sand seed particles. The bed was maintained at 300-600°, and the thermal decompn. of the feed soln. caused its solid reaction products to build up in layers on the bed particles. The introduction of fluidizing gases, such as air, carried the gaseous products from the bed to scrubbers. Amorphous and α - Al_2O_3 were the chief solid reaction products. The redn. in waste vol. was 17-fold for 80% α - Al_2O_3 of bulk d. 1.6 g./cc. and 10-fold for amorphous Al_2O_3 of bulk d. 0.95 g./cc.

Albert E. Nugent, Jr.
Purification of radioactive waste solutions with inorganic natural ion exchangers. I. The use of silicate clay as ion exchanger. G. Sachse and E. Leibnitz (Zentralinst. Kernphys., Dresden, Ger.). *Kernenergie* 4(8), 633-6(1961)(Ger); cf. CA 62, 2442b. Clay from the Radgendorf region was analyzed and characterized by electron microscopy, differential thermal analysis, and x-ray analysis for the purpose of using it for the concn. of the liquid radioactive waste. The stabilization of the clay for use in the column operation was also examd. by mixing polyacrylate with the clay. IV. Leaching resistance of radioactive annealing products of clay from the Radgendorf region. *Ibid.* 5(3), 187-90(1962). The clay samples which adsorbed ^{137}Cs , ^{90}Sr , and ^{144}Ce were heated at 120-900° and the leaching of the activity with H_2O was examd. at room temp. and 80°. When heat-treated at 700°, 0.02% of ^{137}Cs , 0.4% of ^{90}Sr , and 0.3% of ^{144}Ce were leached, but with the clay treated at 900°, <0.05% of ^{90}Sr and ^{144}Ce were leached; thus leaching of the activity decreased with the heat-treating temp. N. Oi

Removal of cobalt and chromium by precipitation and ion exchange on soil, lignite, and clinoptilolite from citrate-containing radioactive liquid waste. D. B. Hawkins. AEC Accession No. 35235, Rept. No. IDO-12036. Avail. OTS, 24 pp.(1964)(Eng). ^{60}Co and ^{51}Cr can be removed from sep. waste streams contg. ammonium citrate and alk. permanganate by a combined process of pptn. and ion exchange. The general procedure used was to neutralize the alk. permanganate with H_2SO_4 and to combine this soln. with the ammonium citrate soln. causing the oxidn. of the citrate. The Co and Cr originally present as complex anions were converted to cationic form by this process and scavenged from soln. by the MnO_2 ppt. formed by redn. of the permanganate. The Co and Cr remaining in soln. were then removed by ion exchange on lignite, soil, and clinoptilolite. Distribution coeffs. for Co and Cr were 56 and 1.2, 800 and 36, and 24 and 0.1 for soil, lignite, and clinoptilolite, resp. Lignite used in combination with the oxidn.-pptn. step resulted in the removal of 99.7% of the ^{60}Co and 95.1% of the ^{51}Cr from the waste streams. From *Nucl. Sci. Abstr.* 18(19), 4713(1964). TCNG

Radioactive wastes disposal. A. N. Marei. *At. Energ. (USSR)* 18(3), 268-70(1965)(Russ). A review is given of the reports on the title subject that were presented at the Third International Conference on the peaceful uses of Atomic Energy, Geneva 1964. A. Aladjem

Biochemical research methods of the phenomenon and of the efficiency of the purification of waste by activated sludge. Lydia Vaicum. *Hidroelek. Gospodarirea Apelor Meteorol.* (Bucharest) 9(10), 546-9(1964)(Rom). A review is given of the mechanisms involved in the purification of waste by activated sludge and of the methods used to control them. Edgar Perry

Biological purification of pulp-manufacturing effluents. M. A. Evilevich. *Tr. Vses. Nauchn.-Issled. Inst. Tsellyulozn.-Bumazhn. Prom.* No. 49, 111-31(1964)(Russ). Biol. purification of effluents of the Svetogorsk pulp and paper mill was studied in pilot plant equipment with a capacity of 120 cu.m./day. Fundamental principles of the process used and calcns. of the process variables are discussed. To carry out the process, the effluents must be subjected to the following preliminary treatment: removal of coarse fibers; redn. of the concn. of fines to 75 mg./l.; deodorization through removal of H_2S , SO_2 , and mercaptans; neutralization; and enrichment with nutrient elements (N and P). Measures must be taken to control foaming, to keep the compn. of the effluents const., and to introduce automation and remote control. The oxidn. capacity of aeration tanks

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27883. OLEINIK, S. F., P. K. LIPATOVA, V. N. ANDREEV, and R. I. KOTSAI. (L'vov Med. Inst., L'vov, USSR.) *Ob izmenenii funktsii legkikh bol'nykh antrakozom posle vyvedeniya ikh na poverkhnost'*. [Changes in pulmonary function in patients (miners) with anthracosilicosis following their transfer to work on the surface.] GIG TR PROF ZABOLEVANIYA 9(4): 17-20. 1965. [Engl. summ.]--The reduced ventilation function of the lungs in miners with anthracosilicosis of the I stage is largely functional and reversible. After ceasing underground work it becomes normal again mostly in 1-1 1/2 years. Miners suffering from anthracosilicosis in its first stage should not re-assume underground duties, for with continued exposure to dust the pulmonary ventilation function becomes subject to a rapid and serious deterioration. In miners afflicted with anthracosilicosis in its II stage, in association with silicotuberculosis, the reduced pulmonary ventilation is due to organic changes. After leaving work, in 1-2 years the pulmonary ventilation function continues to be appreciably below its normal level. --Authors.

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27886. PAVLOVSKII, E. N., I. A. VAL'TSEVA, O. A. MALAKHOV, K. N. SEIFULLINA, and F. F. TALYZIN. (I. M. Sechenov Inst Moscow Med. Inst., Moscow, USSR.) *Sravnitel'naya kharakteristika deistviya yadov zmei: bungarus (Bungarus fasciatus), kobry (Naja tripudians) i gyrusy (Vipera lebetina) na izolirovannoe serdtse yakushki*. [A comparative study of the action of the venom of the snakes Bungarus fasciatus, Naja tripudians and Vipera lebetina on isolated frog heart.] DOKL AKAD NAUK SSSR 162(1): 225-228. Illus. 1965.--At a dose of 1.10^{-2} , the venom of B. fasciatus resulted in the cessation of heart beat in an isolated frog heart within 1.08-2.01 minutes. At the same dose, cobra venom resulted in cessation of heart beat within 1.03-0.05 minutes. The venom of V. lebetina at the same dose resulted in a more rapid decrease in amplitude (within 25 seconds), but in this case, unlike the others, the effect could be reversed by washing the heart in Ringers.--N. Fedoroff.

27887. PETKOV, V., V. STOEV, D. BAKALOV, and L. PETEV. (Inst. Med. Specialization Postgrad. Med., Sofia, Bulgaria.) *Bolgarski preparat satal kak lechenoe sredstvo pri promyshlenoi intokatsii svintsom*. [The Bulgarian preparation Satal (from bulbs of Allium sativum) as a drug for treating occupational lead poisoning.] GIG TR PROF ZABOLEVANIYA 9(4): 42-48. Illus. 1965. [Engl. summ.]--The authors studied the therapeutic efficacy of the preparation "Satal" in a group of workers, in whom clinical and laboratory examinations revealed the presence of some symptoms indicating the adverse effects of lead poisoning (an elevated porphyrin level in urine and basophilic granular erythrocytes in the blood). The administration of "Satal" enteric-coated tablets led to the normalization of both hemological shifts and of the porphyrin content in urine. To the hypotensive effect of the drug the authors also attribute the drop of the arterial pressure to normal values which was elevated in the majority of workers examined prior to the treatment with this preparation. The effectiveness of "Satal" is, apparently, due to the action of active sulfuric components contained in garlic.--Authors.

27888. PIGALEV, S. A. (Munic. Hosp. No. 2, Votkinsk, USSR.) *Rabota s oleinovol' kislotoi*. [Working with oleic acid.] GIG TR PROF ZABOLEVANIYA 9(4): 54-55. 1965.--Oleic acid is used as a lubricating and cooling fluid in metal-working plants in such operations as turning, milling, and drilling where it may reach temperatures of 200-300°C. Analysis of 20 samples showed that under these conditions acrolein was formed as a decomposition product and was present in the air at concentrations of 0.005-0.008 mg/liter. Examinations of 50 workers who had been employed in these metal-working plants for more than 2 years showed that 10 of them had bronchitis. No contact dermatitis was seen since the workers regularly used a protective paste.--M. M. Das.

27889. PIGULEVSKI, S. V. *Ryby opasnye dlya cheloveka*. [Fishes dangerous to man.] 115p. Illus. Meditsina: Leningrad. 1964. Pr. 31 kopecks. From: REF ZH OTD VYPUSK FARMAKOL TOKSIKOL, 1965, No. 8.54.428K.

27890. PUSHIN, G. A. (Sverdlovsk Med. Inst., Sverdlovsk, USSR.) *O porazhenii pecheni i zhelchnykh putei u rabochikh, zanyatykh v proizvodstve nekotorykh vidov plastmass*. [Lesions in the liver and bile ducts in workers producing some kinds of plastics.] SOVET MED 28(2): 132-135. Illus. 1965.--An analysis of liver and bile duct disorders found in 350 workers in the Sverdlovsk Plastic Factory between 1957 and 1960. Pathological liver changes were found in 8% of the plastic workers and in only 2% of the control group. A relationship was found to exist between the incidence of liver and bile duct disorders and the type of plastic with which they worked. The incidence of disorders was highest in workers employed in the manufacture of polychlorovinyl plastics (15%) and lowest in those manufacturing phenol and amino plastics (3.6%). Rolling-mill operators were the most frequently involved class of workers. This is probably due to their exposure to decomposition products of polychlorovinyl (HCl, chlorinated hydrocarbons, etc.) which are evolved during hot rolling. Dibutyl-phthalate, which is used as a plasticizer, may also be involved. Clinically the disorder is chronic epithelial hepatitis. In 9 of the 23 hepatitis patients this was associated with hypochloric or anacidic gastritis, in 15 with functional disturbances of the central nervous system, in 7 with thyroid disorders, and in one with hypochromic anemia.--M. M. Das.

27891. PYATIKOP, A. I., L. P. ARTOMONOVA, and A. A. SHEL'YUZHENKO. *K voprosu izucheniya mikroelementov u bol'nykh ekzemol, svyazannol s proizvodstvennymi khimicheskimi veshchestvami*. [The study of trace elements in patients having eczema related to the production of chemicals.] In: *Professional'nye zabolevaniya i kollagenozy kozhi*. [Occupational diseases and collagenoses of the skin.] Zdorov'ya: Kiev. 73-77. 1965. From: REF ZH OTD VYPUSK FARMAKOL TOKSIKOL, 1965, No. 19.54.324.

27892. RASULEV, I. A., K. Kh. SALIKHOV, and Z. E. BARABASH. *O klinicheskoi karte otravleniya geksakhloranom*. [The clinical picture of hexachlorocyclohexane poisoning.] MED ZH UZBEKISTANA 1. 14-18. 1965. From: REF ZH OTD VYPUSK FARMAKOL TOKSIKOL, 1965, No. 15.54.407. (Translation)--Gives the case histories of 4 members of one family who entered the clinic 6 months after being poisoned by the vapor of hexachlorocyclohexane. The poisoning occurred after treating their living quarters with the compound in dust for warmed on a hot plate. The patients showed general weakness, painful hyperesthesia, disturbed appetite, swelling of the joints, multiple exanthema, and pruritus. Treatment with vitamins B₁, B₁₂ and C, diphenhydramine, CaCl₂, and baths in Tashkent mineral water did not produce any noticeable effect. It is suggested that the exanthema was of a toxic-allergic nature.

27893. RODIN, V. I. *Znachenie elektroaerozol'nykh ingalyatsii v profilaktike pnevmokonioza u shakhterov*. [The importance of electro-aerosol inhalation in the prophylaxis of pneumoconiosis in miners.] In: *Gigiena truda*. [Labor hygiene.] Zdorov'ya: Kiev. 208-211. 1964. From: REF ZH OTD VYPUSK FARMAKOL TOKSIKOL, 1965, No. 18.54.423.

countries.] PEDIAT AKUSHERSTVO GINEKOL 27(4): 60-63. 1965.

HEALTH SERVICES AND MEDICAL CARE

103631. CORMACK, G. C. (Lakeshore Psychiat. Hosp., Toronto, Ontario, Can.), and S. A. HOLLING. [Nursing Homes for psychiatric patients:] special care program, province of Ontario. CAN J PUBLIC HEALTH 66(11): 469-473. 1965.

103632. DURAN, HERNAN. (Avenida Salaverry 722, Lima, Peru.) Health planning in the countries of Latin America. 56(7): 271-275. 1965.

103633. MEDYANYK, R. V. Deyaki pytannya znyzheniya perynatal'noy smernosti v USSR. [Some problems involved in reducing perinatal mortality in the Ukrainian SSR.] PEDIAT AKUSHERSTVO GINEKOL 27(1): 3-6. 1965.

103634. PEAT, R. S. (Ontario Hosp. Serv. Comm., Toronto, Ontario, Can.) [The role of the medical officer of health and continuity of medical care.] CAN J PUBLIC HEALTH 56(7): 285-291. 1965.

103635. PETT, L. B. (Dep. Nat. Health and Welfare, Ottawa, Ontario, Can.) Operational research and health services. CAN J PUBLIC HEALTH 56(11): 457-461. 1965. [French summ.]--Operational research is the use of modern scientific methods to study an action or activity, whether proposed or in process. Health services include anything in the health field that is organized on a community basis--whether the community is local or provincial, with or without federal participation.--From auth. summ.

INDUSTRIAL HEALTH

(See also Toxicology)

103636. ANTONYUZHENKO, V. A., I. M. KASHTANOVA, and R. G. KHILO. (Br. Gor'kii Inst. Ind. Hyg. Occup. Dis., Dzerzhinsk, USSR.) Osobennosti klinicheskikh proyavlenii khronicheskoi intoksikatsii malymi kontsentratsiyami khlorirovannykh uglevodorodov tetrakhloroetana i trikhloroetilena. [Clinical manifestations of chronic intoxication caused by low concentrations of the chlorinated hydrocarbons, tetrachloroethane and trichloroethylene.] GIG TR PROF ZABOLEVANIYA 9(8): 37-41. 1965. [Engl. summ.]--The clinical picture common to chronic occupational poisoning with low concentrations of tetrachloroethane and trichloroethylene, singly or jointly, is described. In all cases the poisoning was manifested by disseminated lesion of the nervous system, the pathological changes caused by shifts occurring in the anterior portions of the brain stem (mesodiencephalic region) being most pronounced. By analyzing the listed data and comparing them with current physiological information it is suggested that the disorders should be attributed to a nonspecific narcotic action of the substances under study.--From auths. summ.

103637. BELYAEVA, L. N. Osobennosti klinicheskogo proyavleniya i techeniya yazvennoi bolezni zheludka i 12-perstnoi kishki u bol'nykh s khronicheskoi professional'noi intoksikatsiei soedineniyami khroma. [Features of the clinical manifestations and course of gastric and duodenal ulcers in chronic occupational poisoning with chromium compounds.] In: Voprosy gigeny, professional'noi patologii i toksikologii. [Problems of hygiene, occupational pathology, and toxicology.] Sverdlovsk. 408-412. 1964. From: REF ZH OTD VYPUSK FARMAKOL TOKSIKOL, 1965, No. 23.54.472.

103638. BLAGODATIN, V. M. (Inst. Ind. Hyg. Occup. Dis., Gor'kii, USSR.) Voprosy gigeny truda v proizvodstve tsianurkhlorida. [Industrial hygiene in the production of cyanuric chloride.] GIG TR PROF ZABOLEVANIYA 9(8): 14-18. 1965. [Engl. summ.]--This paper sets forth sanitary and hygienic characteristics of cyanuric chloride production. The atmosphere of industrial premises is found to become polluted with a complex set of toxic substances, among which the principal ones are cyanogen chloride and cyanuric chloride. While performing individual operations, technological sampling, due to imperfectly sealed off equipment, there is a short-term rise in the concentration of the substances in the air of work premises.--From auth summ.

103639. DITERIKHS, D. D. (Inst. Ind. Hyg. Occup. Dis., Acad. Med. Sci. USSR, Moscow, USSR.) Printsipy stroitel'noi planirovki i ventil'yatsii opytnykh proizvodstv khimicheskoi promyshlennosti. [Principles for the planning of construction and ventilation of pilot plants in the chemical industry.] GIG TR PROF ZABOLEVANIYA 9(11): 11-18. 1965. [Engl. summ.]--This paper cites the most effective arrangements for ventilation systems in chemical industries. Under discussion are various variants of chemical pilot plants reviewed from health standpoint and recommendation are set forth that concern designing and planning (in regard to the shape of the buildings, installation of equipment and ventilation arrangement) of such plants.--Author.

103640. DUBINSKAYA, T. M. (3rd City Hosp., Nizhniy Tagil, USSR.) Lechenie vibratsionnoi bolezni buril'shchikov. [Treatment of vibration disease in drillers.] GIG TR PROF ZABOLEVANIYA 9(7): 43-44. 1965.--Drillers were treated with vitamin E, pantocin (fluid extract from nonossified antlers), methyltestosterone, and testosterone propionate. The patients were sent to resorts for balneological treatment and to suburban evening preventoria where they received complex treatment. The approach to treatment was strictly individual depending on the degree of evidence of the disease and the character of the clinical manifestations. For prophylactic purposes healthy workers were given vitamins; twice a year, in the spring and fall, they were administered vitamins B₁ and C, 2 pills a day for 20-25 days, hot-air baths on the extremities daily after work, ultraviolet irradiation, and massage. The use of general hydrogen sulfide baths yielded the best results. Only 2 of the 70 patients treated did not respond to these baths. In the others sleep improved, headaches stopped, arm pains disappeared, blood pressure normalized, and the general sense of well-being improved. These baths can be widely used for treating vibration disease.

--J. Slep.

103641. ES'KIN, P. L. (Sanit. Inst., Novosibirsk, USSR.) Gigenicheskaya otsenka pylevogo faktora na shakhtakh Kuzbassa. [Hygienic evaluation of the dust factor in mines of the Kuznetsk coal basin.] GIG TR PROF ZABOLEVANIYA 9(7): 3-9. 1965. [Engl. summ.]--The dust factor at 10 mines of the Kuznetsk coal basin during 1959-1962 was evaluated underground workings and stopes. Ventilation, preliminary wetting of the coal in situ, wet drilling, spraying and dust collection, when used separately, helped to reduce the initial dustiness 2-7-fold, and when used together--12-14-fold. The residual dust resulting from the performance of the most dust-producing operations was, nevertheless, 6-7 times higher than the fixed sanitary standard. At hydraulically operated mines the dustiness was considerably below the above-cited figures, but in individual instances it surpassed sanitary standards 2-5-fold. The maximum weighted average production of mine dust containing total and free silica during one shift and relatively higher pneumoconiosis incidence rates were recorded among the operators of holing, stopping and cutting machines, miners servicing shield-operated stopes, drifters and stopers handling percussion drills. These data served as a basis for the development of preventive measures.

--From auth. summ.

103642. FAERMAN, I. S., S. P. SHATROVA, I. A. BOGOSLOVSKAYA, and A. P. OSOKINA. (Inst. Ind. Hyg. Occup. Dis., Gor'kii, USSR.) O kombinirovannom deistvii metiltetiltiofosy, metafosy i promezhtochnykh produktov i ikh proizvodstva. [Combined action of methylthiophosphon, methylparathion, and their intermediates and their production.] GIG TR PROF ZABOLEVANIYA 9(8): 42-46. 1965. [Engl. summ.]--A thorough physical examination of persons engaged in the production of methylthiophosphon and methylparathion revealed vegetative dystonia syndromes attended with manifestations of vagotonia. In the liver a disturbed protein-forming and carbohydrate function were ascertained. Some workers presented diminished uropoepin excretion. In nearly half of the cases the pseudo-cholinesterase was inhibited. Some curative and prophylactic measures are recommended.--From auths. summ.

103643. FILATOVA, V. S., E. Sh. GRONBERG, N. A. SMIRNOVA, E. A. STULOVA, and L. V. ORESHKEVICH. (Inst. Ind. Hyg. Occup. Dis., Gor'kii, USSR.) Voprosy gigeny truda i sostoyaniye zdorov'ya rabochikh, zanyatykh na proizvodstve latekanogo polivinylkhlorida. [Industrial hygiene and the state of health in workers engaged in the production of polyvinylchloride latex.] GIG TR PROF ZABOLEVANIYA 9(8): 9-14. 1965. [Engl. summ.]--Specific feature of the polyvinylchloride latex production is the pollution of the atmosphere in work premises with vinyl chloride. In individual sections of the technological line polyvinyl chloride dust pervades the ambient atmosphere. Some operators handling vinyl chloride exhibit changes in their health condition which are characteristic of initial forms of chronic occupational poisoning with this substance. A set of health measures is recommended to improve work conditions.--Authors.

103644. GOL'DEL'MAN, A. G., and A. P. VORONOVA. Opyt khimio-profilaktiki tuberkuleza rabochikh Dinavskogo zavoda (Predvarit. soobshchenie). [Experience in the chemoprophylaxis of tuberculosis among workers at the Dinavskiy factory: A preliminary communication.] In: Voprosy gigeny, professional'noi patologii i toksikologii. [Problems of hygiene, occupational pathology, and toxicology.] Sverdlovsk. 198-202. 1964. From: REF ZH OTD VYPUSK FARMAKOL TOKSIKOL, 1965, No. 13.54.400.

103645. GOL'DEL'MAN, M. G., I. G. LAVRETSKII, and V. M. OLEFIR. (A. M. Gor'kii Inst. Postgrad. Med., Zaporozh'e, USSR.) O vibratsionnoi bolezni u rabochikh, zanyatykh na nekotorykh vidakh shlitovoi i polirovochnykh rabot. [Vibration disease in workers engaged in some types of grinding and polishing operations.] GIG TR PROF ZABOLEVANIYA 9(7): 37-40. 1965. [Engl. summ.]--Examination covered 100 workers employed at a factory manufacturing flat ware: tapping of of paresthesia in fingers. The examined executed 4 operations: taking off the residual metal after calking the pattern; cleaning the spoon and fork along their contour lines; polishing the fork and spoon; grinding the knife (blade and