

FILE NAME: Chemical Abstracts (CHAB)

DATE: 1969

DOC#: CHAB061

DOCUMENT DESCRIPTION: Abstract Originally Published in 1964 by Wagner

... and human areas are also listed. Sources, damage, and methods for the quant. detn. of SO₂ are also reviewed.

65:28
9/19

Emergency exposure limits; pentaborane(9). J. P. Frawley, *et al. Am. Ind. Hyg. Assoc. J.* 27(2), 193-5(1966) (Eng); cf. CA 63, 4851b. Emergency exposure limits are intended for use in emergency planning by specialists in industrial hygiene. The limits for pentaborane (9) are: 5 min. 25 ppm., 15 min. 8 ppm., 30 min. 4 ppm., and 60 min. 2 ppm. Exposure to 1000 ppm. for one min. can cause convulsions and possibly death. Pentaborane(9) (B₅H₉) boils at 58.4°, and the vapor pressure at 25° is 200 mm. so that a minor spill could cause a rapid contamination above the toxic limits. Pentaborane(9) is insensitive to shock, but it forms shock-sensitive mixts. with many chlorinated hydrocarbon or carbonyl-contg. solvents. 16 references. Wm. MacL. Pierce

The action of various dusts on [guinea pig] macrophages in vitro. W. Klosterkoetter (Univ. Muenster, Ger.). *Beitr. Silikose-Forsch., Sonderband 6*, 125-30(1963)(Pub. 1965)(Ger). The cytopathogenic effects of quartz (I) on various types of leukocytes are reviewed and interpreted, as well as agents which oppose these effects. In new expts., macrophages from the peritoneal exudates of guinea pigs were sepd. by centrifuging and washing, 34 hrs. after the intraperitoneal injection of 20 ml. physiol. saline soln. Admixts. of macrophages were made with dusts of differing chem. compn. in Hanks' soln. at pH 7.2 and incubated at 37°, with various tests run after 2, 4, 6, and 22 hrs. Phagocytosis of I caused a breakup of the cells after 6 hrs. This effect was prevented if 0.1% poly(vinylpyridine-N-oxide) (P 204) (II) was also present. Phagocytosis of corundum, TiO₂, or SiC did not cause disintegration of the macrophages. The cell suspensions normally showed increasing concns. of lactic acid (III) over 22 hrs. in the absence of dusts, and essentially the same amts. of III were produced by cells phagocytizing corundum or TiO₂. In cells phagocytizing I, the formation of III was greatly diminished. In contrast with other reports, quartz glass particles and an amorphous SiO₂ prepn. showed cytopathic effects of the same order of magnitude as those of I, but such effects were completely antagonized by II. Certain dusts (such as of Zn blende) had some effect in diminishing the increase of III in the cell suspensions, but this effect was at least partly antagonized by II. The addn. of guinea pig serum to cell suspensions favored III production although it was not detd. whether the serum diminished the cytopathogenic action of I. Possible mechanisms of action of the various substances on the cells are discussed. W. C. Tobie

Rare metals and their compounds as environmental factors in industry. Z. I. Izrael'son and S. V. Suvorov (I. M. Sechenov 1st Med. Inst., Moscow). *Gigiena i Sanit.* 31(4), 24-30 (1966)(Russ). Discussion of the toxicity, volatility, danger of contact of solns. with the skin, etc., factors to be considered in evaluating rare metals from an industrial hygiene standpoint. John Howe Scott

Metabolic and cardiac effects produced by muscular effort in anthracosilicotics. A. de Coster, R. Messin, and H. Denolin (Hop. Saint Pierre, Brussels, Belg.). *Intern. Congr. Occupational Health, 14th, Madrid 1963(3)*, 1034-5(Pub. 1964)(Fr). The title effects were detd. in 50 anthracosilicosis patients by 15 min. of exercise on a bicycle ergometer. In 30 of the subjects, pulmonary ventilation and O uptake were essentially normal. A 2nd group gave less satisfactory responses, and in a 3rd group (8 patients) muscular effort was poorly tolerated. Blood pH in the 50 subjects was initially increased (emotive hyperventilation). After 5 min. exercise, the pH was almost always diminished. At 10-15 min., the pH tended to rise again but not to initial values. The pH was normal 20 min. after exercise terminated. Blood bicarbonates (I) were almost always lowered after 5 min. of exercise, and remained low despite a slight tendency to increase at the end of exercise. Initial values of I were attained after 30 min. of rest. In the 1st group (with good tolerance to effort), blood lactate (II) had increased at 3 min. and usually reached max. values after 5 min. or sometimes after 10 min. The II usually did not increase above 60 mg. % but sometimes reached 70-80 mg. %. In some cases, II decreased while muscular effort continued. II always decreased 5 min. after effort ceased and was normal 30 min. later. In the 8 persons who tolerated effort poorly, the changes in II sometimes resembled those in the 1st group. In other cases, II continued to increase as long as effort continued and reached high levels. The development of metabolic acidosis in the 3 groups is described. The results are interpreted in relation to differences in hyperventilation in anthracosilicosis of differing extent. W. C. Tobie

Asbestos dust exposure and malignancy [diffuse mesotheliomas of the pleura]. J. C. Wagner (Llandough Hosp., Penarth, Wales). *Intern. Congr. Occupational Health, 14th, Madrid 1963(3)*, 1066-7(Pub. 1964)(Eng). Approx. equal amts. of 3 forms of asbestos, crocidolite (I), amosite (II), and chrysotile (III) are in com. production in South Africa, where 120 cases of the title disease were observed. Exposure to dusts of I (blue asbestos) was demonstrated in 110 of the cases. Only 10 had been di-

rectly exposed to I in industry, while the remaining 100 had lived in the vicinity of asbestos mines or mills. The av. period of exposure to I dust before development of the tumors was 40 years, and asbestosis in the usual sense was not involved. There was exposure to III in only 1 case. Not a single case of mesothelioma involving exposure to II was discovered, although II resembles I in mineral compn. The carcinogenic effects of I probably result from its content of oils and waxes adsorbed on the fiber and contg. polycyclic aromatic hydrocarbons, including 3,4-benzopyrene. Such oils occur in II but to a lesser extent. Investigation of diffuse mesotheliomas in various cities in Great Britain showed that the development of the pathol. processes was assoc. with exposure to asbestos dust in a large majority of the cases. W. C. Tobie

The health of workers processing reinforced polyesters [containing styrene]. R. L. Zielhuis, F. Hartogensis, J. Jongh, J. W. H. Kalsbeek, and H. van Rees (Netherlands Inst. Preventive Med., Leiden). *Intern. Congr. Occupational Health, 14th, Madrid 1963(3)*, 1092-7(Pub. 1964)(Eng). Tests were done in 3 factories in 1959-1962 where the main volatile toxic agent was styrene (I). Concns. of I in the air at various stages of polyester processing are considered. I is moderately toxic, but reports on industrial I poisoning and max. allowable concns. (MAC) are discrepant. In the new tests, the MAC value (considered to be 100 ppm.) was sometimes considerably exceeded, but the av. exposure was below 100 ppm. (420 mg./cu. m. of air). Temporary discomfort (described) was observed, mainly drowsiness and nonspecific irritation of mucus membranes. Despite exposures as long as 5 years, no chronic disturbance of health was observed. No significant changes were observed in hematological values or in blood or urine constituents were observed. In 1 factory, hippuric acid, glucuronic acid, and neutral S in urine were repeatedly detd. at the end of the working day, but no differences were found between workers exposed to I and others. 25 references. W. C. Tobie

The pathology and biochemistry of silicosis produced intravenously in rabbits. M. Mosinger, J. Jouglard-Duplay, A. Versino, and C. Granier (Fac. Med., Marseilles, France). *Intern. Congr. Occupational Health, 14th, Madrid 1963(3)*, 1118-21 (Pub. 1964)(Fr). Rabbits of the Fauve de Bourgogne variety (1.2-1.5 kg. body wt.) were intravenously injected monthly with 100 mg. of silica (I) with a particle size brought to 1-3 μ by sedimentation. Injections were repeated to a total dosage of 500-600 mg. I. The rabbits were observed for as long as 3 years. The av. levels of I attained in the blood serum (av. 0.454 mg. %) were equiv. to the av. values (0.340 mg. %) observed in human silicosis. In some cases, values as high as 1000 mg. % I in blood were observed. However, blood I fell to normal levels 2 months after the last injections. I was accumulated mainly in the liver, lungs, and spleen. Kidney I was nearly the same as in normal animals. Statistical analysis of the effects on blood proteins showed little change in α-globulins in relation to the doses of I or the passage of time. Albumin diminished slightly in proportion to the doses of I and time elapsed. For β-globulins, there were important increases after 500 mg. total doses of I. The increases were marked and permanent after 8 months of treatment. The γ-globulins increased even with 200 mg. total I, after which they increased as much as 140% in proportion to total I and elapsed time. The glycoproteins (α₂-globulins) increased about 30%. The β-lipoproteins increased 30-50%. Both sexes showed approx. 50% decreases in urinary 17-keto steroids, appearing within 1 month of the initial I injection, with continued decreases as the exptl. silicosis progressed. Hepatic and splenic lesions was macroscopically evident. After 4-5 months there was cirrhosis and enlargement of the liver. There was a diffuse splenomegaly and silicotic nodules. Histol. and pathol. changes visible microscopically are described. Normal rabbits showed a slow urinary elimination of Congo red, but silicotic animals eliminated it rapidly. Silicotic nodules were found in the lungs but not in the kidneys. Differences in the accumulation and deposition of I indicated that some body organs are "silicophilic" while others are "silicoresistant." There was an apparent tendency for I to accumulate in organs rich in reticulohistiocytic cells (endotheliovascular cells). Such cells are infrequent in the kidneys but abundant in such tissues as lymphatic ganglions. The neuroendocrine reactions of rabbits to I resembled those previously observed in guinea pigs, rats, and dogs. The marked histol. effects of I on the adrenals was evidenced by the diminution in 17-keto steroid excretion. In 2 silicotic rabbits, there were lesions of the aortic wall contg. mucopolysaccharides and drops of lipid. Deposits contg. Ca were also present. Certain organs showed deposits of amyloid (or possibly para-amyloid or parahyaline) material. The diffuse amyloidosis was assoc. with a marked plasmocytosis and splenic necrosis. 12 references. W. C. Tobie

Urinary elimination of 17-keto steroids by miners, in relation to environmental temperatures. C. Berdan and M. Pafnote. *Intern. Congr. Occupational Health, 14th, Madrid 1963(3)*, 1334-6(Pub. 1964)(Fr); cf. CA 58, 4964d. Previous work is interpreted with new data on reactions of the adrenals in