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MULTIFACTORITY AND SPECIFICITY OF TECHNOLOGICAL PROCESSES OF RESINOTECHNICAL PRODUCTION

The multifactorial nature of technology and the specifics of technological processes, a large variety of chemicals used in the production of rubber products, adverse conditions and intense physical labor can create an unfavorable hygienic environment that has a negative impact on the health of workers. Due to the peculiarities of their physical state of physico-chemical substances, the technological process of rubber production, workers exposed to them with the development in a high percentage of cases of diseases of the upper respiratory tract, digestive organs, skin, etc.

Keywords: *Rubber production, multifactorial, chemical substances*

Introduction. Mechanical rubber production is a subsector petrochemical industry. Characterized by high labor and material consumption, due to the large number of manual operations required for the process, and the consumption of different materials. At the factory workers of rubber products, engaged in basic technological lines, affects the complex unfavorable factors, the main ones are unfavorable microclimate conditions, dust and fumes in the air. A number of negative aspects in the nature of work compounds the impact of unfavorable environment factors: monotonous, forced working posture, the weight of work processes, etc., negative impact on the use of labor resources as a result of working the early development of their production of fatigue, as well as violation of their health status. Per shift production staff is fractional and short-term exposure to toxic chemicals [1].

Working in industrial plants, in rare cases, they are in contact with certain chemicals, usually they are combined, integrated and combined effect of harmful factors of different nature. In foreign literature, these concepts are combined single term "combined effects" [2, 3]. According to several authors [4, 5, 6, 7], a combination of chemicals in combination with the unfavorable environment factors and social conditions has greater toxicity to the human body than its individual components. It is known that the combination of chemicals in combination with the unfavorable environment factors and social conditions has greater toxicity to the human body than its individual components [8, 9].

Materials and methods. The study of sanitary and hygienic conditions of work mechanical rubber production showed that workers preparation workshop (rubber mixer operators, machinists-mixer, weighers) working under adverse operating conditions, which is due to excess content in the air of industrial premises chemicals with general toxic and irritating action. These are primarily high dust jobs, a high concentration of toxic dust mixed composition was observed at the time of loading ingredients into the vortex mixer manually. Formation of aerosols disintegration of complex composition workplace explained partial automation of the process, the use of manual methods in (rub, weighing, sieving, filling, and discharging solids).

Leading harmful occupational factors in the production of rubber products are toxic chemicals (complex chemicals entering the body and working inhalation through the gastrointestinal tract) with physical stress of labor, which are the cause of chronic occupational diseases. The major nosological forms of occupational diseases of major workers manufacturing rubber products are chronic intoxication chemicals and hepatogastroduodenal diseases, pulmonary, cardiovascular, and nervous systems.

Air environment production of rubber products contaminated by toxic products. They are formed during the synthesis of polymers of various purpose (styrene, isoprene, butadiene, etc.), depolymerization, and thermal degradation as dust, vapors and gases. They are complex multi-component system consisting essentially of organic toxic substances. The composition of the vulcanization steam-gas-aerosol mixture includes more than 150 substances of 5 groups of compounds. Among them are: organosulfur - 30% aromatic hydrocarbons - 24%, aldehydes and ketones - 20% paraffins and naphthenes - 16%, amines - 10% [10].

Given the generally accepted classification determination of toxicity and hazard of chemicals essential chemicals in rubber industries are highly toxic (hydrogen chloride, carbon monoxide, 4.4-difenilmetandiizotsionat, oxides of chromium and manganese), moderately toxic (gasoline, tetramethylthiuram disulfide, 2-merkaptobenztiozol) and little toxic (sulfur, sulfur dioxide, aniline, etc.) [11]. The mentioned chemical compounds preferably have general toxic and irritating to the body and fed through mucous membranes of the upper respiratory tract, gastrointestinal tract and skin.

According to the data, P.M. Vatrina., Y.Ts. Andreyeva-Galanina, Y.M. Vitkin., I.I. Livshits., Y.A. Burov, L.N. Arkhangelskaya and A.A. Kasparov et al., one of the most disadvantaged in respect of hygienic production areas of RTI are preparatory workshops. In published work, it focuses dust factor characteristic in preparatory shops and toxicological evaluation of certain ingredients of the rubber composition. According to the above-mentioned authors, preparatory shops have a high dust reaching the area of chemicals weighing 300 mg / m^3. Dust individual ingredients of the rubber composition (thiuram, captax, zinc oxide, etc.) Is from 36 to 81 mg/m^3 [12].

When studying the sanitary conditions of the preparatory rubber plant production of labor set excess air content in industrial premises chemicals having general toxic and irritating. These are primarily high dust jobs (weighers, rubber mixer operators), representing the excess of thiuram by 6.6 times, 3.5 times the sulfur, carbon black is 3.5 times, 1.3 times of talc. The high concentration of the toxic dust mixed composition was observed at the time of loading the ingredients into the vortex mixer manual [13].

Typically, during the production of rubber products we have the combination of their effects. According to reports, the incidence of temporary disability among business enterprises rubber products subject to the combined action of dibutylphthalate tetramethylthiuramdisulphide and exceeds the control by 38%, and the proportion increased 7 times [14, 15].

Results and discussion. The contribution of a particular component of a complex steam-gas-aerosol mixture toxic effect may vary depending on the level of exposure. With this change occurs leading determining the clinical picture of intoxication toxic components of different and complex steam-gas-aerosol mixtures thermooxidative degradation products of the polymeric materials. Therefore, the simultaneous effect on the body of chemicals may lead to a qualitatively new effect of the toxic mixture and isolating the product isolated components different from effects [16].

The multistage technology and specific processes, a wide variety of chemical substances of general toxicity and irritant action, used in the production of rubber products, adverse microclimatic conditions and intense physical labor create complex adverse environment factors that have a negative impact on morbidity and functional condition of the organism employed.

The dependence of the incidence of workers of rubber-production of synthetic rubber on length of service. The highest morbidity registered among workers with 10-15 years of experience or more years. Leading in the structure of morbidity production staff personnel are rubber-pathology of the digestive system, nervous system and skin, as well as increased risk of cancer.

In view of the specifics of the technological processes and multifactor technology, a wide variety of chemicals used in the production of rubber products, noise, unfavorable microclimate conditions and intensive physical work can create a very unfavorable hygienic situation has a negative impact on morbidity and functional status of the body work.

It is generally accepted that the disease is an important indicator of the health of production personnel. The close relationship between the nature of work and the incidence of a number of authors have noted. As the overall incidence and the specific forms of the most complete and fully reflect the actual state of health due to social and professional factors. Their level is directly dependent on the degree of adaptability to changing operating conditions in the production of harmful and occupational factors [17, 18].

Note that not only harmful factors may cause the formation of occupational diseases, but also may be a pathogen etic mechanism for the development and progression of common diseases of non-professional category [19]. According to the author [20], especially the formation of occupational diseases, the terms of their development and the severity of the pathological process determined by the specific conditions of work and length of service.

The works devoted to the analysis of the incidence on the rubber-production plants indicating a relatively high level of temporary disability among drivers and roller mixer. Comparison level of temporary disability group roller with collectors that do not suffer such intensive influence of various chemical substances, evidenced by a higher incidence of liver diseases roller. Morbidity structure as described by the literature: first place belongs to diseases of the respiratory system - they account for 49.6% of the cases, the second - diseases of the digestive system - 11.8% of cases, followed by diseases of the skin and subcutaneous tissue, injuries and diseases of the nervous system and sensory organs feelings.

Conclusion. As a result, with the duration of exposure to toxic chemicals and their chronic exposure to workers, occupational diseases formed by periods. Origin - subclinical functional, biochemical and morphological changes of organs (systems), the critical factor for a particular professional. Second - initially monosymptomatic or monosyndromic reaction. Third - polysyndromic manifestations characteristic of a particular occupational disease [21]. Last characterized by the development of systemic disease of the respiratory system, digestive and cardiovascular systems, and others.

Thus, given that in manufacturing rubber products are widely used chemical substances of general toxicity and irritant action, since the characteristics of their state of aggregation, physico-chemical properties, manufacturing processes working basic trades exposed to them with the development of a sufficiently high percentage of cases, lesions of pulmonary, hepatogast oduodenal, cardiovascular and nervous systems. The study of working conditions major workers rubber production revealed that the "complexity" technology and specific processes, still forms a complex adverse environment factors, the leading ones are the dust mixed composition (thiuram, talc, carbon black, sulfur, etc.), vulcanizing gases (phenol), climate and noise.

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ТЕХНИКАЛЫҚ РЕЗЕҢКЕ ӨНДІРІСІНДЕГІ ТЕХНОЛОГИЯЛЫҚ ҮРДІСТЕРДІҢ ЕРЕКШЕЛІКТЕРІ ЖӘНЕ КӨП ФАКТОРЛЫҒЫ

Түйін: Жұмысшылардың денсаулық жағдайына қолайсыз гигиеналық ортаны құрайтын көп факторлы технологиялар мен технологиялық үрдістердің ерекшелігі, техникалық резеңке өндірісінің қолданысындағы әр түрлі химиялық заттар денсаулыққа зиян келтіріп, қолайсыз жағдайлардың тууына себеп болады. Физикалық-химиялық заттардың физикалық жағдайының ерекшеліктеріне байланысты резеңке бұйымдарының технологиялық процесстері жұмысшыларда жоғары тыныс жолдарының, асқорыту органдарының, тері ауруларының және т.б. аурулардың жоғары пайызды дамуына ұшыратады.
Түйінді сөздер: техникалық резеңке өндірісі, көп факторлық, химиялық заттар

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МНОГОФАКТОРНОСТЬ И СПЕЦИФИКА ТЕХНОЛОГИЧЕСКИХ ПРОЦЕССОВ РЕЗИНОТЕХНИЧЕСКОГО ПРОИЗВОДСТВА

Резюме: Многофакторность технологии и специфика технологических процессов, большое разнообразие химических веществ, применяемых в процессе производства резинотехнических изделий, неблагоприятные условия и интенсивный физический труд способны создавать неблагоприятную гигиеническую обстановку, оказывающую отрицательное влияние на состояние здоровья рабочих. Ввиду особенностей их агрегатного состояния физико-химических веществ, технологического процесса резинотехнического производства, рабочие подвергаются их воздействию с развитием в высоком проценте случаев заболеваний верхних дыхательных путей, органов пищеварения, кожных покровов и др.
Ключевые слова: многофакторность, резинотехническое производство, химические вещества

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ОЦЕНКА АКТИВНОСТИ СУПЕРОКСИДДИСМУТАЗЫ ПРИ ДЛИТЕЛЬНОЙ ИНГАЛЯЦИИ ПЫЛИ УРАНОВОЙ РУДЫ В ЭКСПЕРИМЕНТЕ

Установлено, что пролонгированная экспозиция урановой пыли, содержащей естественные радионуклиды, вызывает активацию процессов перекисного окисления липидов (ПОЛ) и изменение активности некоторых ферментов антиоксидантной защиты (АОЗ) в организме животных. Важнейшим ферментом антиоксидантной защиты организма и её биомаркером является супероксиддисмутаза (СОД). В связи с вышеизложенным, целью данного исследования явилась оценка антиоксидативного действия экстракта корня солодки при длительном воздействии на животных пыли урановой руды. Несмотря на широкий спектр литературы по использованию лечебных препаратов, выделенных из корня солодки, в доступных нам источниках не встречались сообщения о влиянии корня солодки на систему антиоксидантной защиты организма в условиях урановой интоксикации. В результате проведенных исследований было выявлено, что ингаляционное воздействие пыли урановой руды в дозах 5 и 10 ПДК подавляет активность системы антиоксидантной защиты в легочной ткани проявляя при этом дозо-временную зависимость. Наибольшее снижение активности СОД у опытных животных наблюдалось к концу эксперимента. Водный экстракт корня солодки при пероральном введении в дозе 100 мг/кг в течение 30 суток повышал активность супероксиддиссмутазы в легких животных, подвергавшихся действию ПУР в дозах 5 и 10 ПДК, однако эффективность его была недостаточной.
***Ключевые слова**: пыль урановой руды, экстракт корня солодки, супероксиддисмутаза*

Введение. В настоящее время разработка и применение эффективных препаратов-радиопротекторов является чрезвычайно важным. Одним из актуальных направлений в этой сфере является изучение радиопротекторных и иммуномодулирующих свойств фитопрепаратов, с целью повышения иммунологической реактивности организма, подвергшихся воздействию радиационного фактора. (Быков 1996:113-114, Аммосов 1995: 116-145). Радиопротекторные

ПСИХИАТРИЯ И НЕВРОЛОГИЯ

СТОМАТОЛОГИЯ

ФТИЗИАТРИЯ И ФТИЗИОПУЛЬМОНОЛОГИЯ

ХИРУРГИЯ

СПОРТИВНАЯ МЕДИЦИНА

РАЗДЕЛ 2. ТЕОРЕТИЧЕСКИЕ ДИСЦИПЛИНЫ

ГИГИЕНА И ЭКОЛОГИЯ