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VISION

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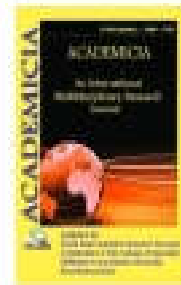
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ATMOSPHERIC DUST AND ITS EFFECTS ON HUMAN HEALTH

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ABSTRACT

This article provides information on the effects of dust in atmospheric air on human health, types and sizes of dust in industry and production, the impact of dust on the upper respiratory tract. The amount of dust trapped in the body increases when you breathe deeply, for example when working hard, as well as when the amount of dust in the air increases. Silicosis usually develops over many years in very dusty conditions, often during strenuous physical activity. Such dusts can include the formation of eroded layers of sand and soil under the influence of wind and severe storms, dust from flora and fauna, volcanic eruptions, meteorites from space exposed to the Earth's atmosphere from space, and dust from other space objects.

KEYWORDS: *Erosion, Meteorite, Dispersion, Amorphous, Pneumocoinosis, Silicosis, Silicosis.*

INTRODUCTION

Dust generation and decomposition are observed in almost all work performed in industry, vehicle operation, and agriculture. In general, the types of powders are considered as natural and artificial powders, taking into account their sources of origin. It is known that the dusty air environment has haunted mankind since ancient times.

Natural powders include powders that are formed in nature without human intervention. Such dusts can include the formation of eroded layers of sand and soil under the influence of wind and severe storms, dust from flora and fauna, volcanic eruptions, meteorites from space exposed to the Earth's atmosphere from space, and dust from other space objects. The amount of natural dust in the atmosphere depends on the natural conditions, weather conditions, seasons and in which region the zone is located. For example, the amount of dust in the atmosphere is known to be higher in the southern regions than in the northern regions, in the desert zones than in the forest zones, as well as in the summer months compared to the winter months [1].

Artificial dust includes dust generated as a result of direct or indirect human exposure in industrial plants and constructions. In some industries, such as the chemical industry, hazardous industrial dusts are released in such a way that their removal without cleaning would create catastrophic situations.

According to the origin of the dust, it is defined as organic, mineral and mixed powders. The description of the harmful effects of dust depends mainly on its chemical composition. The harmful effects of industrial dust on the health of workers depend on many factors. These include, first of all, the physical and chemical properties of dust particles, their size and shape, the amount of dust in the air, the duration of exposure during the shift and the simultaneous exposure to other factors such as occupational period, environment and labor activity. For example, when the outside temperature rises or when a person is engaged in physical labor, the level of dust entering the body increases as a result of frequent breathing. At the same time, the presence of radioactive aerosols in the dust and the effects of other gases in the air increase the harmful effects of dust on the body. There will be individual differences in the body's exposure to dust exposure, which depends on the filtering properties of the airways, biological resistance, and so on. In addition to the hygienic effect of dust separation, there are other disadvantages: it accelerates the decomposition of technological equipment, causing economic damage by disposing of valuable materials. It also worsens the overall sanitary condition of the production environment, including reducing light due to contamination of windows and lighting fixtures. Some types of dust, such as coal and wood dust, can cause fires and explosions.

The chemical composition and solubility of powders, the size (dispersion) of powders, the shape of particles, the structure of their hardness (crystalline, amorphous), the properties of electric charge are important in influencing the organism. The chemical composition of dust determines the effect of dust on the body in many forms. The main effect of dust occurs primarily when inhaled. Inhalation of dusty air can lead to the development of mainly respiratory damage: bronchitis, pneumoconiosis or general damage (poisoning, allergies). Some powders have the property of causing additional diseases. This non-primary effect of dust is observed in diseases of the upper respiratory tract, mucous membranes of the eyes, skin. The entry of dust into the lung tract can lead to the development of pneumonia, tuberculosis, lung cancer. Silicon (II) oxide (especially its crystalline type), silicates (salts of silicic acid), coal, powders of some metals (aluminum, etc.) and mixtures of various powders, such as mineral-metal powders, according to their chemical composition in the development of pneumoconiosis, will be dangerous. These dusts are practically insoluble and are trapped in the deeper parts of the respiratory system when inhaled and cause disease, leading to the development of connective tissue in the lungs. From this point of view, free crystalline silicon (II) oxide, i.e. quartz dust and its other types, is the most dangerous dust. The danger of additional pathogenic powders cannot be directly proportional to their solubility. For example, amorphous silicon has a higher solubility than quartz, but quartz has a higher risk of additional disease.

When inhaled with dusty air, much larger dust particles are trapped in the upper respiratory tract, mainly dust particles that are 5 μm and smaller fall into the deeper sections of the airways. The amount of dust trapped in the body increases when you breathe deeply, for example when working hard, as well as when the amount of dust in the air increases. Silicosis usually develops over many years in very dusty conditions, often during strenuous physical activity. This disease is an occupational disease of mining workers and has long been known. Silicosis begins with

shortness of breath, cough, chest pain. In the earlier stages, these symptoms are less noticeable, with shortness of breath occurring only when doing physical work. Shortness of breath and wheezing occur during the period of exacerbation of the disease when performing normal activities and even in a calm state. Dust in production not only causes pneumoconiosis, but also other diseases of the respiratory tract, skin and mucous membranes. These include migration of skin cells, various rashes, eczema, dermatitis.

The following measures are taken to prevent dust diseases:

- 1) Legislative measures
- 2) Measures against the formation and spread of dust
- 3) Personal protection measures.

According to the Labor Code of the Republic of Uzbekistan, a medical examination is carried out before starting work, which may be exposed to industrial dust. People suffering from pulmonary tuberculosis and its extra pulmonary forms, diseases of the upper respiratory tract and bronchi, organic diseases of the cardiovascular system, etc. are not admitted to dusty work. Individuals under the age of 20 should not be placed in dusty jobs because pneumoconiosis develops faster in young people and is more severe than in adults. In general, there are documents that set the maximum permissible level of dust in the air of industrial enterprises, rooms and shops, which do not endanger the health of those working in these areas. Technological measures will be most effective in combating the formation and spread of dust. At the same time, manual work will be transferred to automatic methods, the tightness of the equipment will be increased, and a remote control system will be introduced.

In the mechanical engineering industry, replacing the cleaning of castings with a stream of sand by mixing it with a water spray or by cleaning it with water, cleaning with acids completely eliminates the risk of silicosis. In the refractory products industry, the possibility of silicosis is reduced due to the replacement of quartz and dinas materials with magnesium. In some industries, the production of products in the form of granules and pastes instead of powders dramatically reduces or eliminates powder separation processes.

Personal protective equipment-respirators, special helmets and suits for fresh air are used in cases where it is not possible to reduce the dust in the air in the workplace with the most basic general measures of technological and other characteristics. The Lepestok respirator is the most common, in which the inhaled air is filtered through a woven layer of special synthetic fibers. It is very effective (98 to 99.9% depending on the type of fabric used in the respirator), has almost no resistance to breathing (2-3 mm water column), is lightweight and easy to use. In other respirators, only the inhaled air passes through the filter, the exhaled air exits through a special valve. The best of these respirators is the FPP, which also serves as a filter cloth in the Astra-2. In some jobs, such as sandblasting, cleaners are used to send fresh air to workers' breathing areas. Fresh air is sent to the bottom of the helmet via special hoses, the hoses are connected to the belt and have a valve to control the amount of air supplied.

It is important to determine the amount of dust in the air in industrial production zones. When familiarizing with the production process, it is necessary to determine the sources of dust and the causes of dust formation, hygienic assessment, taking into account the quality composition and quantity of dust in a certain volume of air. Based on this, the importance of the dust factor is

assessed, information on the health of workers is collected when necessary, and dust control measures are determined on the basis of this evidence. The study of dust factors present in an industrial enterprise begins with the study of the technological process, equipment, raw materials, methods of its transportation and processing. At this stage, it is usually possible to determine the chemical composition of the powder. However, the dust that is released when the raw material is processed in different ways may be different from the raw material dust. In such cases, it will be necessary to further identify dust types that are more harmful to health, such as silicon (II) oxide.

The pursuit of a goal that is important for one's life, not to hesitate in difficult situations and not to lose the goal, to be able to organize one's activities properly, leads to high elevation and good health. After all, striving for a goal is the primary force that drives a person and ensures his health. A person can live happily only if he has good health. After all, only if everyone deeply understands that the preservation of such a valuable asset as health is a guarantee of a peaceful life, it is possible to prevent the occurrence of disease and related problems. Therefore, everyone should be primarily responsible for the health of himself, his family and loved ones. It should be borne in mind that prevention is easier and more effective than treatment of any disease [2].

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