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# FACTORS AFFECTING THE WORKING PROCESS OF INDUSTRIAL DUST GASES CLEANING APPARATUS

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**ANNOTATION:** The total amount of solid, liquid and gaseous substances released as waste from industrial enterprises on earth is 100 billion. exceeded tons. This means that 14 tons of waste is produced per person on earth as environmental protection is one of the global problems of the world, it is important to find effective ways of cleaning the waste materials that are generated in this regard, which are inextricably linked with the production processes.

**Key words:** liquid and gaseous substances, pollution, properties of aerosols, granular layer, hydrodynamic stability, capture and neutralize, aerodynamic characteristics.

## Introduction

These problems caused by the scientific and technical development of human activity can be solved only with the help of scientific research. [1,2]

In order to reduce the pollution of the environment with industrial waste, first of all, it is necessary to identify all the sources of waste in the currently operating enterprises, ensure their hermeticity, take measures to capture, neutralize, and dispose of the outgoing waste, widely use zero-waste technologies in the new projects being created, and apply environmentally friendly processes, requires the introduction of the most perfect energy-saving types of machines and devices. In addition, to study the mechanical, physical and chemical properties of various gases, dusts, fogs, solid and liquid substances released into the environment, to classify them according to their general characteristics, to capture, neutralize or reuse (utilize) them based on the properties of aerosols, liquid and solid waste. The choice of methods is also important. [3]

Until now, many scientific researches have been conducted in the direction of capturing and neutralizing industrial waste, but scientifically based solutions and recommendations have not been developed for each sector of industrial production.

In particular, the information on the structure of the granular layer and the movement trajectory of the flow passing through it, the speed profile, is insufficient for their statistical generalization. [4,5,8,15]

Scientific data on the hydrodynamic stability of the flow and its length at the entrance to the devices that are supposed to capture and neutralize aerosols generated in the chemical industry are fragmentary and sometimes contradictory. These data do not allow accurate prediction of hydraulic resistances in the apparatus.

For this reason, the processes occurring in the granular layer of the devices that serve to capture and neutralize chemical industry waste, its structure, obtaining and generalizing new research results, using them to create high-efficiency processes and machines, is one of the urgent tasks of chemical technologies.

In the opinion of some authors, the non-uniformity of gas distribution in granular layer devices with different (different levels) of porosity is related to the structure of the granular layer and the location of the pores in it.[6,9,20,21,25]

The geometric shape of granular materials with a fixed layer used in the chemical industry (spherical, prismatic, cylindrical, pyramidal, ring-shaped, saddle-shaped, etc.), the method of loading them into the apparatus, the pressure of the granular material from the upper layer to the lower layer, the geometric shape of the apparatus, the longitudinal and transverse sections of the internal working volume Many factors such as the shape, the ratio of the average diameter of the apparatus (D) to the average diameter of the granular material (D/d) influence the change of the porosity of the granular layer have been highlighted in many factor studies. The methods of measuring the location of the porosity in the cross-section of fixed granular layer apparatuses currently used in the chemical industry can be conditionally divided into 3 groups.

1. Light (-1929 Fuvnas, Koroleva - In 1971 -1973 Studied Painting And Graphic Puschnow, Popov And 1980, Abaev - 1981).
2. Liquit (Javoronkov - 1944, Zavelev - 1976, Koleskin -1982).
3. Mechanical (-1960 Sountag, Schmidt - 1967, -1971 Gupta, Zavelev -1978).

Exact measurement of your footprint porosity-layer flow rate between structured and allows the assessment of the associated.[3,6,25]

From that point forward, the structured layer location, its structure and distribution of health in which promising as a method for measuring gas without breaking the connection between the control (retention) method can show. You

$W_{max}$ – maximum flow rate of gas.

$W_o$ – the average speed of the gas flow, m\s.

$W_m$- in the center of the speed of the hardware, say,

$W_{Max}\backslash W_o$ – comparing Wmax\Wm.

Relatively little change is observed,

For this reason, the attempts of some researchers to standardize the speed profile using only the inter-device speed Wn have not been successful.

In the scientific literature, information on gas distribution in devices with large amounts of the D/d ratio is rarely found.

In the studies conducted by Popov (1980) and Klenov, Matros (1985) on devices with D/d 100, the flow velocity near the wall of the device was neglected.

There are not many scientific research studies on the influence of the shape of the granules forming the granular layer on gas diffusion along the cross-section of the device.[5,14,21,22,23]

It is necessary to know the structures of dusty gases released into the atmosphere in large industrial enterprises in order to increase the efficiency of fixed granular layer industrial aerosol cleaning devices, to reduce energy consumption, to determine the optimal dimensions of the device, and ultimately to achieve the most modern, perfect technical solution.

The main task of scientific research is the issue of increasing the efficiency and energy efficiency of cleaning dust gases released into the atmosphere from industrial enterprises, and the issues of creating perfect designs of new-generation dust cleaning devices serve as the basis for the solution of the above-mentioned topical issues.

According to official data, production processes emit 1-1.5 times more waste to the environment than the standard demand. This, in turn, means that there is a need for a lot of scientific research in this field. The geometric shape of the newly designed apparatus design, the properties of the granular materials, their loading method, the aerosol flow rate, require that they be selected separately for each case in accordance with the process.[1,9,11,13,15]

Based on the above, let's consider the design parameters that affect the factors that affect the process of capturing harmful substances in the devices that are used to capture chemical industry waste and now need to be created:

D – device diameter, m;

d – structured material, diameter, m;

D/ d – diameter ratio to the diameter of the structured material of hardware

$W_0$ – empty full gas flow to the incisions of the hardware, which had average speed, m/s

Experiments were also conducted with the aim of studying the interaction of the shape of the device with granular material in a wide range, establishing the limit of hydrodynamic stability of the immovable granular layer at different values of D/d ratio, and studying its aerodynamic characteristics.

Then having a different shape-layer structured in hardware D/ d=1.2 ÷ 500, W=0.1 and ÷ 4.2 m/c gas value to the distribution D, d, $w_0$ – the effects of the factors studied.

**Conclusion.** The feasibility of studying the structure of the device that captures the harmful waste generated as a result of the technological processes of the production enterprise, the characteristics of the granular materials used in the process, and several other factors as the parameters determining the efficiency of dust gas cleaning and energy consumption was analyzed.

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