

The Problem of Environmental Pollution

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Abstract

The article deals with the problem of environmental pollution, which is relevant today. Factories, exhaust gases, garbage - all this is harmful to the life of the planet. That is why, according to the authors, a person must fight for the purity of nature.

Assessing the level of atmospheric air pollution in cities, taking into account the impact of vehicles, is an extremely topical issue, since every second a person needs high-quality atmospheric air.

Key words: environment, analysis, protection, atmospheric air, source.

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Relevance

According to the World Health Organization, the leading factors that determine both individual and public health of the population include the state of the environment. Technological progress entails not only economic achievements, but also the emergence of new environmental factors [9,11]. The contribution of anthropogenic factors to the formation of health deviations, according to some authors, ranges from 10 to 57%, according to others - from 40-60% and more [2, 3,4.]. At the same time, the assessment of the significance of environmental pollution according to the biological responses of the human body, health indicators is more objective than comparing the concentrations of individual pollutants with hygiene standards, because. integrally takes into account the impact of all, including unidentified, pollutants, their complex and combined effects on the human body.[1]

Long-term studies to assess the impact of environmental factors on public health have made it possible to identify not only priority environmental factors, but also individual chemical pollutants and their origin. This allows us to conclude that the impact of a complex of atmospheric air pollutants causes a variety of adverse deviations in the state of public health, and also to show that the most pronounced effects of aerogenic pollution are formed in the child population [3, 6,7]. It is children who are especially

susceptible to the influence of adverse factors due to the fact that they have not yet developed evolutionarily fixed forms of adaptation [8, 9, 12,]. The car is a source of pollution in the city, where the air is not only depleted of oxygen, but also contaminated with harmful components of exhaust gases. The mechanism of the impact of road transport on the environment has a number of specific features. Cars burn a huge amount of fuel from petroleum products, causing significant damage to the environment, mainly the atmosphere. Vehicles are sources of carbon monoxide, nitrogen oxides, sulfur dioxide, and suspended solids. According to the literature data [5], each car emits about 200 different components into the atmosphere with exhaust gases. At the same time, the observed mass character and the constantly growing pace of the motorization process lead to a discrepancy between the categories of roads and streets. As a result, the city begins to experience an increased traffic load when it is impossible to expand existing roads and streets. Consequently, the increasing traffic load in the urban environment is the cause of an increased level of atmospheric air pollution. The requirements for ensuring environmental safety and protecting public health should be met when planning and building settlements. On the territory of settlements, it is necessary to ensure the achievement of regulatory requirements and standards that determine the quality of atmospheric air [4].

Target. Quality control of the air environment in the city to obtain experimental information about the level of air pollution in specific areas in the city. Development of preventive measures to protect the environment from air pollution.

Methods and investigation. To obtain experimental information on the level of atmospheric air pollution in specific areas in the city, field studies (route observations) of traffic flows in the road network were carried out. Field studies were carried out during 2009–2010.

The presented analyzes were performed on the basis of the analytical laboratory "Center for Hygiene and Epidemiology in the Region". At the monitoring points, monitoring was carried out according to the minimum sufficient indicators, allowing to control the environmental and hygienic situation with the shortest time. Sampling was carried out from 06:00 to 13:00 and from 14:00 to 21:00. At the same time, the wind speed (m/s) was measured and its direction was noted. Measurements were taken at a level of 1.5 m from the ground, in the human breathing zone. The TESTO-445 and ANT-3M gas analyzers were chosen as working devices. The measurements were made in accordance with the passport requirements for the operation of these devices. Atmospheric air measurements and analysis were performed for the main pollutants: suspended solids, nitrogen dioxide, sulfur dioxide, carbon monoxide. [13].

Results and discussions. The field measurements of atmospheric air carried out by this laboratory on city highways with the most intensive traffic confirm the presence of pollution in the atmospheric air and discussion of the study of indicators that exceed the normative values for the period 2018-2020. presented in the table. Atmospheric air measurements carried out by a mobile laboratory in the remaining surveyed areas of the city show that the maximum concentrations of harmful substances are observed in areas immediately adjacent to the carriageway of highways, as they move away, the concentrations decrease (from 20 to 1.5 MPC). In general, the results of the analysis indicate that in order to create a complete picture of air quality in a given city, it is enough to plan the observation network correctly (locate observation posts correctly), study the qualitative side of emissions in the city, and measure the concentrations of 6–8 substances regularly at all stations ; create a mathematical model of city pollution by atmospheric transport (determine the number and location of calculated points), taking into account the indicators of field studies.

Air pollution levels and laboratory control for 2020					
Determined Ingredients	№ line	Urban settlements, railway stations		Rural settlements, stations, sidings	
		Number of samples - total	of which exceeds the MPC, total	Number of samples - total	of which exceeds the MPC, total
A	B	1	2	3	4
TOTAL	1	3235	55	308	18
Dust	2	906	22	81	12
Sulphur dioxide	3	812	16	81	3
hydrogen sulfide	4	170		10	
Carbon monoxide	5	330		45	
carbon disulfide	6				
Nitrogen oxide	7	812	17	81	3
Ammonia	8	205		10	
Air pollution levels and laboratory control for 2019					
Determined Ingredients	№ line	Urban settlements, railway stations		Rural settlements, stations, sidings	
		Rural settlements, stations, sidings	of which exceeds the MPC, total	Number of samples - total	of which exceeds the MPC, total
A	B	1	2	3	4
TOTAL	1	5200	88	1723	81
Dust	2	1326	39	486	39
Sulphur dioxide	3	1248	24	347	26
hydrogen sulfide	4	445		150	
Carbon monoxide	5	505		250	
carbon disulfide	6				
Nitrogen oxide	7	1248	25	347	16
Ammonia	8	428		143	

Air pollution levels and laboratory control for 2018					
Determined Ingredients	№ line	Urban settlements, railway stations		Rural settlements, stations, sidings	
		Rural settlements, stations, sidings	of which exceeds the MPC, total	Number of samples - total	of which exceeds the MPC, total
A	B	1	2	3	4
TOTAL	1	6108	162	2136	171
Dust	2	1809	78	513	132
Sulphur dioxide	3	1421	47	471	23
hydrogen sulfide	4	396		135	
Carbon monoxide	5	547		371	
carbon disulfide	6				
Nitrogen oxide	7	1543	37	420	16
Ammonia	8	392		140	

Conclusions; Thus, the steadily increasing traffic load in the modern urbanized environment is the cause of an increased level of air pollution. Emissions from vehicles in urban areas enter the surface layer of air, where their dispersion is difficult. Depending on the distribution of traffic flows in the city, under the influence of meteorological conditions for the dispersion of impurities, concentration fields are formed. The historically established urban infrastructure determines the sets of impurities to be monitored. Observations of the concentrations of substances in the atmospheric air are typical for each city.

Therefore, on the territory of settlements, it is necessary to ensure the achievement of regulatory requirements and standards that determine the quality of atmospheric air, ensure environmental safety and protect public health during planning and development. transport. At the same time, the density of the network of main transport lines is currently 0.6 km/km², in the future it is planned to be 1.4 km/km² [1.16.17]. The traffic flows of the city are concentrated mainly in the central part of the city, a particularly critical situation develops at the intersections of the load of busy main streets during the hours of maximum traffic intensity. To clarify the actual state of atmospheric air in terms of pollutants in such territories with the lowest financial and labor costs, it is necessary to use a set of information on emission sources, as well as maps, which are used to perform a preliminary territorial analysis [3,9]. All this will allow, at relatively low costs, to obtain maximum information about the sources of emissions and the level of pollution of adjacent territories. The main source of experimental information for determining the background concentrations of pollutants in the city is the data from stationary observation posts for atmospheric air pollution of the center for hydrometeorology and environmental monitoring. The choice of the location of stationary posts in the organization of observations of atmospheric pollution in the city was carried out by the bodies of the hydrometeorological service in accordance with the requirements of regulatory documents: GOST R 52136-2003 "Nature Protection. Atmosphere. Rules for air quality control in settlements"; IEC 61779-6-99* Guidelines for air pollution control. Since this hydrometeorological post is located in the zone of influence of urban vehicles. This circumstance served as the basis for choosing a research topic: the content of pollutants in the atmospheric air from vehicle emissions on city highways. Atmospheric air measurements carried out by a mobile laboratory in the remaining surveyed areas of the city show that the maximum concentrations of harmful substances are observed in areas immediately adjacent to the carriageway of highways, as they

move away, the concentrations decrease (from 20 to 1.5 MPC).

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