AIR POLLUTION IN NAVOIY CITY DURING 2016–2017 AND ITS ANALYSIS

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Abstract: This scientific article analyzes the concentration of air pollutants in the atmosphere of Navoi city during the years 2016 and 2017, with a particular focus on the monthly fluctuations of these pollutants. The study also highlights the number of days when nitrogen oxides—one of the most harmful gases for residential areas—exceeded the permissible limits. Based on the obtained results, the article provides general conclusions, along with practical suggestions and recommendations for improving air quality.

Keywords: Navoi city, atmosphere, air pollutants, nitrogen oxides, sulfur dioxide, carbon monoxide, ammonia, phenol.

In recent years, the rapid development of industrial enterprises in the city of Navoiy has made the study of its environmental condition a pressing scientific issue.

The increasing population density, growth in industrial capacities, and the rising number of vehicles all have a direct impact on the quality of atmospheric air. In particular, the environmental changes observed in Navoiy city during the years 2016–2017, the volume of pollutants emitted into the air during this period, and their spheres of influence require a thorough analysis.

Although many scientific articles provide general analyses of air pollutants, their specific effects under local conditions—especially the role of industry-specific sources in Navoiy—have not been sufficiently addressed. For this reason, this article is dedicated to conducting an in-depth analysis of the main causes of air pollution in Navoiy during 2016–2017, taking into account the city's unique geo-economic and ecological characteristics.

The main objective of this study is to identify the dynamics of harmful substances found in the air during these years and to reveal their real impact on human health and the environment.

This approach aims not only to evaluate the situation based on statistical indicators, but also to create a scientific foundation for developing effective strategies to combat the existing environmental problems.

Let us now analyze the results of observations conducted in the research area.

Table 1.
Average Monthly Concentration of Air Pollutants in Navoiy City for 2016 (mg/m³)

No	Month	Dust	Sulfur Dioxide	Carbon Monoxide	Nitrogen Dioxide	Nitric Oxide	Phenol	Ammonia	Ozone
1	January	0.1	0.002	1	0.04	0.03	0.001	0.02	–

No.	Month	Dust	Sulfur Dioxide	Carbon Monoxide	Nitrogen Dioxide	Nitric Oxide	Phenol	Ammonia	Ozone
2	February	0.1	0.002	1	0.05	0.05	0.001	0.03	–
3	March	0.1	0.002	1	0.05	0.05	0.001	0.03	–
4	April	0.1	0.002	1	0.05	0.05	0.001	0.02	–
5	May	0.1	0.002	1	0.05	0.04	0.001	0.04	0.015
6	June	0.1	0.002	1	0.05	0.04	0.001	0.04	0.015
7	July	0.1	0.003	1	0.05	0.05	0.002	0.04	0.012
8	August	0.1	0.003	1	0.05	0.05	0.002	0.04	0.013
9	September	0.1	0.002	1	0.05	0.04	0.002	0.03	0.013
10	October	0.1	0.003	1	0.05	0.04	0.002	0.03	0.015
11	November	0.1	0.002	1	0.04	0.04	0.002	0.03	–
12	December	0.1	0.003	1	0.05	0.04	0.002		

Table 2.
Average Monthly Concentration of Air Pollutants in Navoiy City for 2017 (mg/m³)

No.	Month	Dust	Sulfur Dioxide	Carbon Monoxide	Nitrogen Dioxide	Nitric Oxide	Phenol	Ammonia	Ozone
1	January	0.1	0.003	1	0.04	0.04	0.001	0.04	–
2	February	0.1	0.002	1	0.04	0.03	0.002	0.03	–
3	March	0.1	0.002	1	0.05	0.04	0.001	0.02	–
4	April	0.1	0.002	1	0.05	0.05	0.002	0.03	0.016
5	May	0.1	0.002	1	0.05	0.04	0.001	0.03	0.014
6	June	0.1	0.003	1	0.05	0.05	0.002	0.04	0.017
7	July	0.1	0.004	2	0.05	0.05	0.002	0.05	0.013
8	August	0.1	0.004	1	0.05	0.05	0.002	0.04	0.012
9	September	0.1	0.004	1	0.05	0.06	0.002	0.04	0.013
10	October	0.1	0.004	1	0.05	0.05	0.002	0.03	0.012
11	November	0.1	0.003	1	0.04	0.04	0.002	0.03	–
12	December	0.1	0.003	1	0.04	0.06	0.002	0.02	–

Monitoring results show that during the years 2016–2017, the concentration of suspended particulate matter in the air of Navoi city remained relatively stable. This indicator stayed around 0.1 mg/m³ per month throughout the two years, not exceeding the normative limits. This suggests that either the sources of dust emissions operated steadily or the air purification systems were functioning efficiently.

As for carbon monoxide (CO), its level also remained mostly stable at around 1 mg/m³ in both 2016 and 2017, with the exception of July 2017, when it rose to 2 mg/m³. This increase could be linked to intensified transportation activity or industrial operations. Nevertheless, in general, the annual concentration of carbon monoxide remained consistent.

In contrast, fluctuations were observed in the concentration of sulfur dioxide (SO₂). In 2016, the gas levels ranged mainly between 0.002 and 0.003 mg/m³, while in 2017, the concentration reached up to 0.004 mg/m³ in some months. This indicates an increase in sulfur dioxide levels in 2017 compared to the previous year. The rise was particularly noticeable in the summer months, possibly due to increased industrial activities or intensified operation of thermal power plants.

Based on this analysis, it can be concluded that while the concentrations of some harmful gases remained stable, there was a notable upward trend in certain pollutants, such as sulfur dioxide. This trend is critical for assessing the year-on-year changes in air pollution levels and highlights the need for implementing effective environmental protection measures.

During the period of 2016–2017, the concentrations of nitrogen dioxide and phenol—classified as air pollutants—were recorded at relatively consistent levels in the atmosphere over the territory of Navoi city. Notably, the phenol concentration at the beginning of 2016 was slightly lower; however, by the end of that year, its value aligned with the levels recorded throughout 2017. This trend indicates a gradual increase in phenol emissions during the observed period, eventually stabilizing at a higher concentration level.

During the 2 years of observation in 2016-2017, no significant fluctuations in gas values were observed. Also, based on the results observed during the 2 years, observations were recorded that the amount of nitrogen dioxide exceeded the norm in residential areas. In particular, 5 observations were recorded in May 2016, 3 in July, 2 in September, and 4 in October. Similarly, in 2017, such values were recorded by month, as follows: 2 in May, 2 in June, 3 in July, and 6 in August. Exceeding the norm of such polluting gases in the air can lead to various negative consequences. In conclusion, it can be said that when comparing and analyzing the results of 2 years of observation in the studied area, we can see that the amount of harmful gases in the air has increased. One of the most important tasks is to warn the necessary organizations and the population to prevent such situations. Therefore, studying the composition of atmospheric air and further strengthening measures to monitor it are considered to be one of the effective solutions to this problem.

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