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ANALYSIS OF ATMOSPHERIC AIR OF SURKHONDARYO REGION USING PHYSICO-CHEMICAL METHODS

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Abstract: It is very important to study the environmental problems in the southern regions of Uzbekistan and the harmful effects caused to people, animals and plants. Atmospheric air pollution, sudden warming and drying of the air affect the environment and ecological system. Therefore, it was aimed to study polluted atmospheric air, dry and hot atmospheric air, dry soil temperature, and the amount of methane and carbon dioxide gas in the air. The article analyzes indicators such as air temperature, carbon dioxide, methane gas, atmospheric pressure, water vapor, altitude above sea level based on physico-chemical methods. Using the MULTI-PURPOSE anemometer, the results were obtained on air temperature, humidity, wind temperature and speed, direction, water vapor, atmospheric pressure, altitude and illumination level. Soil temperature, dry and wet soil temperature were measured using Thermometer GM8910. The amount of SH_4, CO_2 gases in the air was determined using the Portable Multi-gas measuring device. 20 stationary points were determined and measured from the city of Termiz and the district of Termiz in the southern region of Surkhandarya region. In the conducted experiments, it was studied on a scientific basis that each neighborhood has its own air temperature, atmospheric pressure, gas amounts and their specific parameters. The amount of methane in atmospheric air is determined from 0.02 to 0.3 percent. The highest amount of gas corresponds to Tinchlik neighborhood and 41-AYOKSH (car filling station).

In order to study environmental problems in the southern regions, the amount of carbon dioxide and methane gases in the air, as well as atmospheric pressure, water vapor, height above sea level, and illuminance indicators were determined and analyzed using physical and chemical research methods. The obtained results show that the amount of carbon dioxide and methane gas in the atmosphere is very low, but the amount of these gases has specific values at each experimental point. Air temperature, atmospheric pressure and other parameters specific to each neighborhood were studied, and on the basis of them, it was scientifically confirmed on the basis of experiments that the laws of change of physical parameters depend on geographical parameters. Based on the obtained results, it was proved that it is the basis for determining the physico-chemical properties of rapidly changing atmospheric air, which is one of the urgent problems of physico-chemistry.

Keywords: Air temperature, atmospheric pressure, sea level, climate, lighting, ecology, water vapor.

Introduction. Atmospheric air is considered one of the main important components of the environment. The health status of people, animals, and plants in matter depends on the amount of gases and vapors in the air and the influence of physical factors. During the following decades, the sudden change of the atmospheric air in the southern regions of Uzbekistan and the rapid development of scientific development, which are used as a result of all technological processes, the release of more or less harmful substances have a negative impact on nature.

The data and results obtained from the areas of Termiz city and Termiz district, which are considered to be the southern part of Surkhandarya region, show that there are natural and artificial environmental problems in the regional scale. The climate

conditions and geographical environment in the southern region of Surkhandarya region are very different from the northern region. The city of Termiz and the territories of Termiz district have their own ecological problems, and solving them is an urgent issue today. The main environmental problem in the southern regions is the sudden change of the air atmosphere. Based on the study of the impact of this environmental problem on the national economy and the determination of the laws of changes in the dynamics of atmospheric air, to review and make changes in the zones where this environmental problem occurs, as well as to study the impact of this environmental problem on the human factor is important.

Contamination of the atmospheric air causes the ozone layer to emit harmful ultraviolet radiation and spread to the earth's surface, which is of great importance. One of the reasons for the change in atmospheric air today is the depletion of the ozone (O_3) layer. The environment is constantly changing and this problem cannot be ignored.

Litersture review on the topic: Atmospheric air is being studied that the distribution of NO_2 concentration in the area is not stable, that H_2O, CO_2 and other greenhouse gases are the main factor of the exchange flows between the soil and the atmosphere, that the rapid increase in CO_2 concentration leads to a decrease in the permeability of the atmosphere and subsequent changes in the leaves, liquid water CO_2 mixing ratios and change the isotopic composition of oxygen (10 and 180) in CO_2 through isotopic equilibration Merino R. A. & Gassmann M. I., Massman W. J. & Frank J. M., Ding F., Wordsworth R. D., Gan L., Lu T., Shu Y., Konrad W., Catul G., Roth-Nebelsick A., Yuan W., Xu B., Chen Z. et al., Rojas F.J., Pacsi S., Sánchez-Ccoyllo O.R, Perales M.M., Espinosa Guzmán A.A. , foreign scientists such as Mai Tzuc O., Balam Panti I., Reyes Trujeque J., Quintana I.V, Bassam A. and Niyozova O.A., Turaev X.Kh., Jumaeva Z.E., Abdikadirov Sh.A. Eshkaraev S.Ch. and other scientists of our republic have studied the effects of changes in the atmosphere, the amount of gases and vapors contained in them, on the organism of people and animals, and on plants.

Research methods: Using the MULTI-PURPOSE anemometer, the results were obtained from air temperature, humidity, wind temperature and speed, direction, water vapor, atmospheric pressure, altitude and illumination level. Soil temperature, dry and wet soil temperature were measured using thermometer GM8910. The amount of CH_4, CO_2 gases in the air was determined using the Portable Multi-gas measuring device.

Analysis and results: 20 stationary points were determined from the territories of Termiz city and district. Modern equipment was used for monitoring in designated areas. For continuous monitoring in the southern regions of Surkhandarya region, simultaneous measurement of methane and carbon dioxide gases was carried out using Portable Multi-gas, a portable gas measuring device that determines the concentration of several gases in atmospheric air. The equipment used for atmospheric air monitorin is presentedin Table1.

Table 1. The name and brand of the equipment in use.

№	Equipment name	Brend
1	Multi-purpose anemometr	GM8910
2	Thermometer	
3	Portable Multi-gas Detector: CH_4,CO_2,SO_2,NO_2	KP836

MULTI-PURPOSE ANEMOMETR is designed to measure air temperature, humidity, wind temperature and speed, direction, water vapor, atmospheric pressure, height above seal level, and illumination level.

THERMOMETER is designed to measure the temperature of the sun, dry and wet soil. Portable Multi-gas Detector is designed to detect the amount of CH_4, CO_2, SO_2, NO, gases in the air.

Surveys were conducted from stationary points in the city and district of Termiz, Surkhandarya region, in the summer and autumn months of 2023. The reason for choosing to conduct monitoring in summer and autumn in the city and district, which is the southern region of Uzbekistan, is due to the dry and hot climate of the atmosphere. The amount of methane and carbon dioxide gases in atmospheric air, air temperature, level of evaporation, atmospheric pressure and level of illumination were studied (tables 2-3).

Table 2. Measurement results of some indicators in the atmospheric air of Termiz district.

№	Stationary points name	CO_2 (%)	CH_4 (%)	Air temperature, °C	Water pavor	hPa pressure	Height above sea level, m	Illumination, lk
1	district Tinchlik	0,073	0,03	38,9	14,9	969,6	368	4028,0
2	41-CR	0,13	0,027	33,2	13,36	968,5	382	1112,8
3	district Pattakesar	0,075	0,02	34,7	14,25	970,4	364,5	3738,5
4	district Termiz	0,08	0,01	27,1	15,5	965,8	404,0	3590,0
5	building gidromet	0,075	0,025	33,85	12,25	976,8	309,5	7007,5
6	district Soliobod	0,07	0,02	32,5	14,6	970,9	360,0	5529.0
7	Aeroport	0,08	0,03	39,4	16,5	968,3	382	4953,0
8	district Qirq yilik	0,075	0,015	40,15	19,3	967,5	389,5	5987,5
9	Kindergarten 14	0,07	0,02	33,0	16,3	973,9	335,0	6129,5
10	Kindergarten 13	0,07	0,01	41,15	15,8	968,8	382,5	1016,1
11	School 24	0,075	0,01	32,4	14,65	976,3	314,0	5817,0

Table 3. Results of measurements of some indicators in the atmospheric air of the city of Termiz.

№	Station points name	CO_2, (%)	CH_4 (%)	Air temperature, °C	Water pavor	kPa pressure	Height above sea level, m	Illumination, lk
1	Pattakesar neighborhood, "Murch bobo" mosque.	0,075	0,02	37,5	16,15	971	359	5575
2	Termiz state university	01	0,3	32,7	12,37	968,7	383	4455,7
3	DSP factory	0,08	0	37,11	25,45	969,9	369	3752,0
4	Pattakesar neighborhood, neighborhood building	0,08	0,02	35,1	13,0	970	369	6352
5	Jo'yijangal neighborhood, "Diydor" wedding hall	0,08	0,03	37,5	17,2	968,6	377	4894
6	14-school	0,07	0,02	33,8	13,5	977	362	3830
7	Saxovat neighborhood,	0,055	0,02	35,1	14,0	970	363	4480
8	Bog'ishamol neighborhood,	0,077	0,047	35,27	17,3	967,8	386,7	72387

The amount of carbon dioxide and methane gases in the atmospheric air of Termiz city and district egions. The amount of methane in atmospheric air is determined from 0.02 to 0.3 percent. The highest amount of gas is Tinkhlik neighborhood and 41-CR (car refueling) corresponds to.

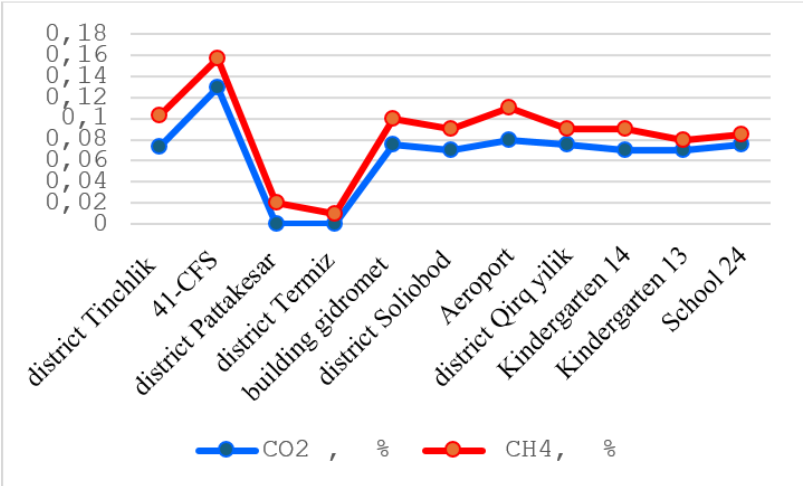

Figure 1. The amount of gases in the air taken from the city and districts of Termiz.

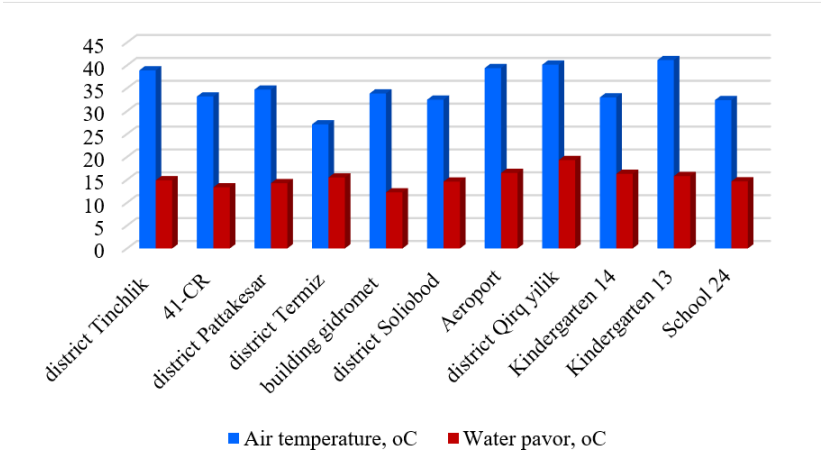

Figure 2. Air temperature and water vapor diagram of Termiz city and district.

Air temperature and water vapor indicators were determined in Termiz city and district, and the specific air temperature of each neighborhood was studied. The highest air temperature was observed around Kindergarten 13, Pattakesar Mahalla, Tinchlik, Qirq yillik.

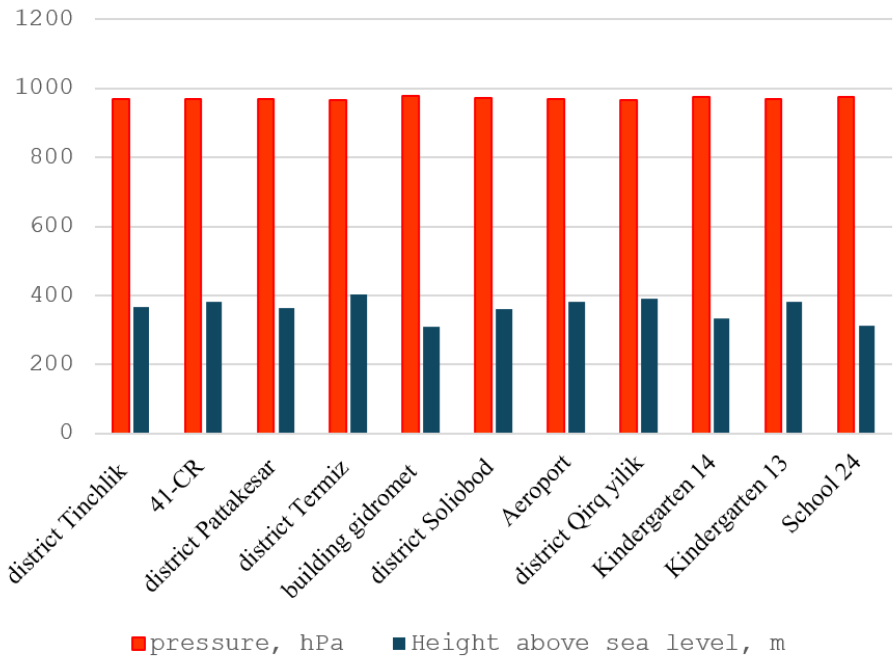

Figure 3. Height above sea level of stationary points in the city and district of Termiz and pressure diasram.

Atmospheric pressure and altitude indicators in Termiz city and district were studied. The highest indicator was found in Termiz, Soliabad neighborhood, around the Airport. Low indicators were found around Airport hydromet, Kindergarten 14 and 24th school. Atmospheric pressure gave the same reading in almost all regions.

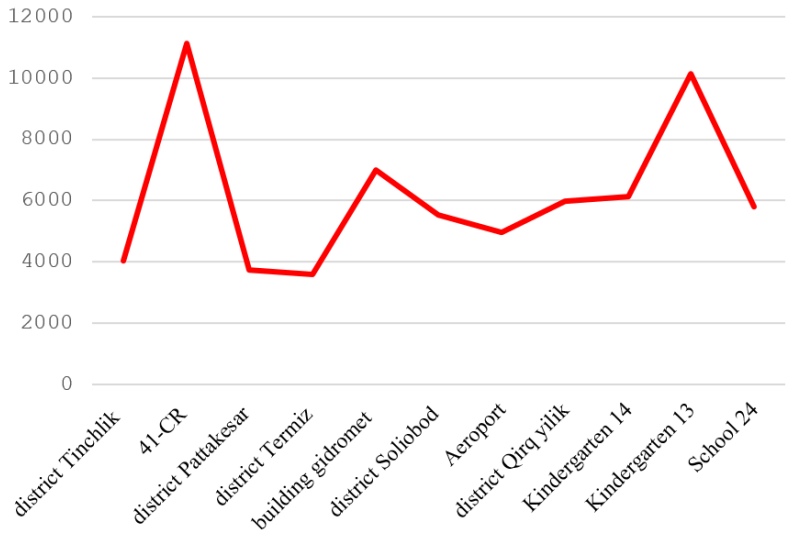

Figure 4. Illumination indicator of stationary points in Termiz city and district.

Illuminance indicators are determined and analyzed. The highest level of illumination coincided with the areas of Tinchlik Mahalla and 41-CR (car refueling). The lowest level of illumination was found around Soliabad, Kirqyil Makhala and the airport. The illuminance indicator rises when approaching the Hydromet building, and sharply decreases in Pattakesar and Termiz neighborhoods.

Discussion. During the following decades, sudden changes in the atmospheric air in the southern regions of Uzbekistan and the rapid development of science, as a result of all the technological processes used, the release of more or less harmful substances have a negative effect on nature.

The data and results obtained from the territories of Termiz city and Termiz district, which are the southern part of Surkhandarya region, show that there are natural and artificial environmental problems of regional scale. The climate conditions and geographical environment in the southern region of Surkhandarya region are very different from the northern region. The analysis of the results obtained in this article shows that even though it was determined that the amount of carbon dioxide and methane gas in the atmosphere is very low, the amount of these gases has specific values at each experimental point. Air temperature, atmospheric pressure and other parameters specific to each neighborhood were studied, and on the basis of them, it was scientifically confirmed on the basis of experiments that the laws of change of physical parameters depend on geographical parameters. Based on the obtained results, it was proved that it is the basis for determining the physico-chemical properties of rapidly changing atmospheric air, which is one of the urgent problems of physico-chemistry.

Conclusion. Based on the experiments conducted, the amount of carbon dioxide and methane gases in the air, as well as atmospheric pressure, water vapor, height above sea level, illuminance indicators using physical and chemical research methods to study environmental problems in the southern regions of the Republic of Uzbekistan identified and analyzed.

The obtained results show that although the amount of carbon dioxide and methane gas in the atmosphere is very low, the amount of these gases has specific values at each experimental point. Air temperature, atmospheric pressure and other parameters specific to each neighborhood were studied, and based on them, it was scientifically confirmed based on experiments that the change laws of physical parameters depend on geographical parameters. On the basis of the obtained results, it was proved that it is the basis for determining the physico-chemical properties of rapidly changing atmospheric air, which is one of the urgent problems of physico-chemistry.

It was confirmed that the change in the amount of gases in the air in the territories of Termiz city and Termiz district has its own characteristics. It was observed that changes in the amount of carbon dioxide in the atmosphere were consistent with the amount of gases in all experimental areas. It was confirmed in experiments that the ecological conditions in the territories of Termiz city and Termiz district are very close to each other.

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