

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ БІЛІМ ЖӘНЕ ҒЫЛЫМ МИНИСТРЛІГІ
Л.Н. ГУМИЛЕВ АТЫНДАҒЫ ЕУАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ



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БАЯНДАМАЛАР ЖИНАҒЫ

СБОРНИК МАТЕРИАЛОВ
XI Международной научной конференции
студентов и молодых ученых
«НАУКА И ОБРАЗОВАНИЕ - 2016»

PROCEEDINGS
of the XI International Scientific Conference
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«SCIENCE AND EDUCATION - 2016»

2016 жыл 14 сәуір
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The proceedings are the papers of students, undergraduates, doctoral students and young researchers on topical issues of natural and technical sciences and humanities.

В сборник вошли доклады студентов, магистрантов, докторантов и молодых ученых по актуальным вопросам естественно-технических и гуманитарных наук.

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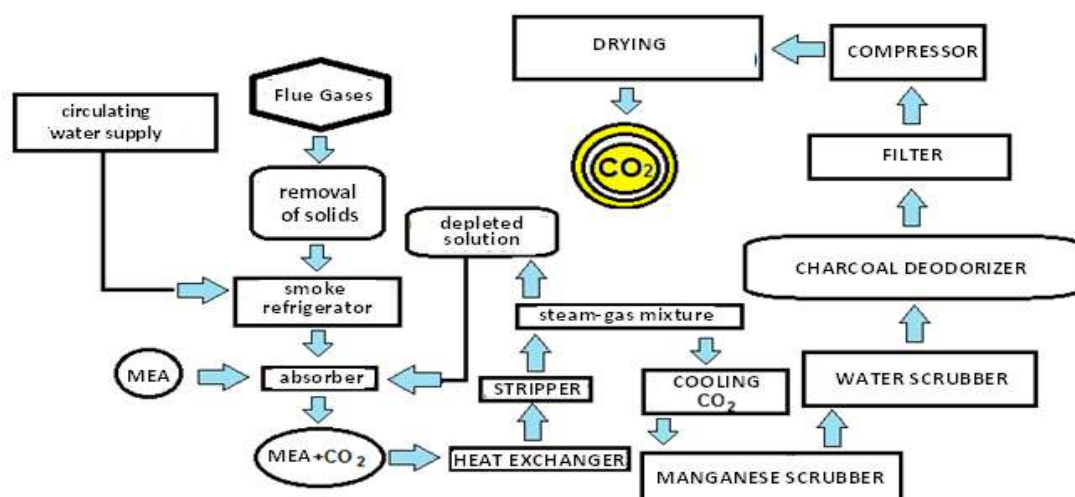


Figure 2. Schematic diagram of obtaining CO₂ from coal combustion products

Thus, in the design of new facilities "production waste" section should be excluded replacing it with a "secondary resources" with the prospect of the producing from them another products. This will reduce the ecological load on the environment and improve its quality.

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AIR POLLUTION IN CHINA AND KAZAKHSTAN AND HEALTH EFFECTS OF AIR CONTAMINATION

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One day I noticed that there is a problem of air pollution in my city. I live in Kokshetau. When I was walking the city I saw a huge building which was discharging vast amount of pollutants. Even felt that it became difficult to breathe the air because it was full of smog. Then started thinking on consequences of industrial air pollution.

I am going to make a project about industrial air pollution. Industrial air pollution (IAP) is pollution resulting from industrial plants discharging pollutants into the atmosphere (Princeton University, 5). There are different types of industrial pollution, such as ground, air and water pollution. However, in my point of view, air pollution is most common type of industrial contamination that is why I will focus on it. Moreover, air pollution can lead to ground and water

contamination with the help of rain. Nowadays it is a considerable issue in developing countries such as China. There is no doubt that air pollution is everywhere; however, the level of it is different.

Before that I made a project concerning global warming. The name of that project was “What are the causes of global warming”. While making it I understood that one of the main causes of global warming is linked to air contamination. While making my project I learned some information about industrial emissions. I found that China is the country which is suffering the most from air pollution.

Generally, I am interested in making this research because Kazakhstan is developing country, so it uses vast amount of coal. Coal is one of the main sources of energy in Kazakhstan as well as in China. As I mentioned before coal using can lead to respiratory illnesses. Leader of Kazakhstan Health Ministry, representative of “Respiratory medicine association of Kazakhstan” said that 29-30 thousands of 100 thousand populations in Kazakhstan suffer from respiratory illnesses (Ledeneva, 2). Aigul` Aubakirova, chief of health department of Kokshetau said that IAP is one of the causes of respiratory illnesses in our country (Aubakirova, 3).

Additionally, I want to suggest the youth organization “ZhasOtan of Kokshetau” to create a competition among students on best project aimed to decrease IAP in Kazakhstan or project on substitutes for coal. I should prove them why it is important to reduce industrial air contamination. In order to prove it I should be aware of health problems which are caused by air contamination and public opinion on this type of issue.

Population of people is rapidly growing. That is why human beings had to develop their industry. There is no doubt that the start of the significant industrial pollution is industrial revolution. Industrial revolution is the conversion to a new type of manufactory. It changes tools and organization of production. Industrial development requires energy. Thus, human beings started burning vast amount of coal in order to satisfy their need. Coal combustion had lead to IAP.

Industries emit small particles, such as particles of lead into the atmosphere. Every year the amount of industrial facilities is increasing as the economic level is increasing. It is obvious that in order to run that facilities we need energy. Coal combustion is one way of producing energy. It leads to creation of harmful chemicals, such as arsenic, mercury. This emissions include carbon dioxide, sulphur dioxide and suspended dust particles. Such conditions can lead to respiratory disease, gastrointestinal disease, nervous system and sensory organ disturbances (Walsh, 2).

16 out of 20 world’s most polluted cities are situated in China (Walsh, 1). The level of pollution in China was increasing, as the economy of this country was increasing. There is no country in the world which could reach at such a high economic level without damaging the environment of its country (Walsh, 1).

We know that breathing polluted air is dangerous for our health. However, CO₂ particles do not stay at the same place; they are transferred by the wind to another area. For instance, Japan has experienced huge amounts of acid rain due to air contamination from China (Lockwood, 2). Such particles have been found in tiny amounts in countries, which are situated far away. Kazakhstan and China are neighboring countries. Thus, contaminants from China can be easily transferred to our country.

IAP leads to respiratory illnesses. There is information that industrial pollutants can cause a lung cancer and bladder cancer. Additionally, this type of pollution is one of the causes of death in China. Scientists claim that IAP contributed to 1.2 million untimely deaths in [China](#) in 2010 (Wong, 1). Mortality is one of the most serious consequences of IAP in China.

Of the air pollutants from coal burning, the main murderer seems to be related to small particles (particulate matter lesser than 2.5 µm in aerodynamic width). Lockwood said that little particles might cause heart sickness, stroke, adverse pregnancy outcomes, IQ loss, and even diabetes. It is obvious that PM 2.5 can lead to respiratory illnesses; however, they do not stop their way in our lungs. They are transferred by blood from lung to other internal organs such as heart (Lockwood, 3). Daily standard of PM_{2.5} is equal to 25 µg/m³ (WHO, 3). But, in China average daily amount of PM_{2.5} is approximately 60.7 µg/m³ (WHO, 4).

It is obvious that PM 2.5 can lead to respiratory illnesses; however, they do not stop their way in our lungs. They are transferred by blood from lung to other internal organs such as heart. Of the IAP from coal burning, the main murderer seems to be related to small particles (particulate matter lesser than 2.5 μm in aerodynamic width). Lockwood said that little particles might cause heart sickness, stroke, adverse pregnancy outcomes, IQ loss, and even diabetes (Lockwood, 3).

The purpose of my research project was to investigate the air quality of China. I want to illustrate serious problems which are caused by air contamination. As Kazakhstan wants to become a developed country there is possibility that our country could have such problem. There is no doubt that both Kazakhstan and China have problems related to air conditions. If our country will increase using coal-fired power plants, then the situation will get worse. Thus, the government of Kazakhstan and population should undertake actions for preventing it. I have chosen China as an example for illustrating problems related to poor air conditions.

I am expecting to understand adolescents' opinion on poor air condition and its effect on health. I want to know the awareness of people on consequences of IAP and particle matters (PM). Additionally I want to know if youth think that the air quality is likely to get worse as in China or not.

Therefore in this research the main research questions were:

- How adolescents are aware of industrial air contamination in China?
- What are the consequences of IAP on humans' health?
- How aware youth are about effects of IAP on health?
- What do youth think about IAP in Kazakhstan?

The objective of my research work is to increase public awareness on air pollution. There is a possibility that people will start thinking on serious consequences of air pollution and project will encourage them to suggest government new ways for tackling with poor air conditions.

While making a project primary and secondary research methods were used. Primary research includes one-to-one interview and online survey. Secondary research involves library and internet. The reason why various methods were used is that if I would use just secondary research then it will not show me public opinion on this issue, so I used primary research methods.

First of all secondary research method were used for searching the background information. I was trying to find available data from the library. But there was no suitable information in English. Researching the internet gave me opportunity to find out background information. However, while searching the internet a lot of data concerning air pollution was found. That is why it was difficult to prioritize what of the sources are relevant. It could add an inaccuracy in my research. I tried to use my knowledge about evaluating sources and I was researching for credible websites. Authorship, on the language of author and on credibility of the article was evaluated for selecting reliable data. Moreover, research was concentrated upon internationally respected sources such as The Guardian and Greenpeace.

First survey was carried through thesurveymonkey.com and distributed through social media. The reason why internet was used is that nowadays a lot of people use it and it will not take a lot of time to extend, to carry out such survey and to collect the result of it. The survey was published on surveymonkey.com. Then survey was distributed among students of NIS. I have chosen this school because there are adolescents which can represent youth of our city. As I mentioned before, the purpose of this survey is to investigate youth awareness and opinion on air pollution.

Survey was intended for 11th and 12th grade students of NIS. The reason why this target was chosen is that adolescence are creative and they are our future generation, so they should be aware of IAP. Validity is also important part of the survey. If results will show that 11th and 12th grade students know about health problems linked to air pollution and they think that air contamination in Kazakhstan is likely to get worse, then it means that youth of Kazakhstan may be interested in creating some projects aimed on struggling with poor air conditions.

This survey took about 7-10 minutes per each. A survey was created for 120 people. In my point of view this number is enough to be generalized for whole adolescents of Kokshetau.

In order to make survey reliable clear instructions were given. In order to get representative information surveys were carried out among equal number of males and females, students from different grades and equal number of students from Kazakh and Russian groups. Generally, I surveyed approximately 60 students from 11th grade and 60 students from 12th grade.

Survey through the internet does not give us full illustration of persons' opinion because surveyor is limited in his answers. This is the reason why personal interview was carried out. It gave me detailed illustration of public awareness and opinion on air pollution because I can ask additional questions. I asked students from NIS who volunteered to take part in personal interview. 6 students took part in face-to-face questionnaire. Personal survey took place in our NIS of Kokshetau. Each of the survey took about 15-20 minutes. In order to create a comfortable atmosphere surveyor was sitting on the sofa with a table nearby.

As I mentioned before while making this project both primary and secondary research methods were used. Secondary research methods gave opportunity to find out a lot of appropriate data. To sum up, secondary research showed that human beings' actions contributed to industrial air pollution. Coal combustion leads to emissions of harmful chemicals and particles such as carbon dioxide and suspended dust particles. Such particles can cause several illnesses and diseases.

Primary research gave me opportunity to understand peoples' awareness on IAP and peoples' opinion on IAP in Kazakhstan and China. A brief summary of results of questionnaire is written below. More detailed results of the survey are included into the appendixes.

- The data from first question revealed that 96.7% of the female and male adolescents responding on that survey strongly agreed with the statement that air contamination is a global problem, among them 73.55% strongly agreed with it.
- 73.5% of the surveyors know that 16 out of 20 worlds' most polluted cities are located in China.
- 76.67% of the respondents think that coal combustion is considered to be a significant cause of air pollution and 93.33% of respondents think that industries lead to air pollution. There is a big difference between genders for those who reported that globalization is a significant cause of IAP (*Table 1*).
- 8.33% of surveyors reported that starch and calcium are outcomes of IAP, there is a difference 11th and 12th grade students (*Table 2*).
- 88.4% of respondents know that carbon dioxide is an outcome of IAP.
- 40% of 12th Kazakh group students and 46.67% of Russian 12th grade students reported that suspended dust particles are outcomes of IAP.
- 91.67% of respondents agreed that small particles from industries are harmful for humans' health, among them 65% strongly agreed.
- 76, 67% of male and female respondents know that lung cancer can be caused by IAP.
- Just 5% of respondents who study in 12th grade know that IQ loss can be caused by IAP while 20% of 11th grade students are aware about that (*Table 3*).
- 88.3% of 11th grade students and 86.7% of 12th grade students agreed with the statement that IAP is a problem in Kazakhstan, with 71.6% and 38.33% strongly agreed (*Bar chart 1*).

The percentage of students reporting that these causes are significant causes of IAP

Table 1.

cause of IAP/ Gender	Male	Female
Burning coal	76,67%	68,33%
Industries	93,33%	90%
Globalization	8,3%	25%

Possible outcomes of coal

Table 2.

	11 th kaz	11 th rus	12 th kaz	12 th rus
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Starch	0%	3,33%	10%	16,67%
Calcium	0%	0%	3,33%	16,67%

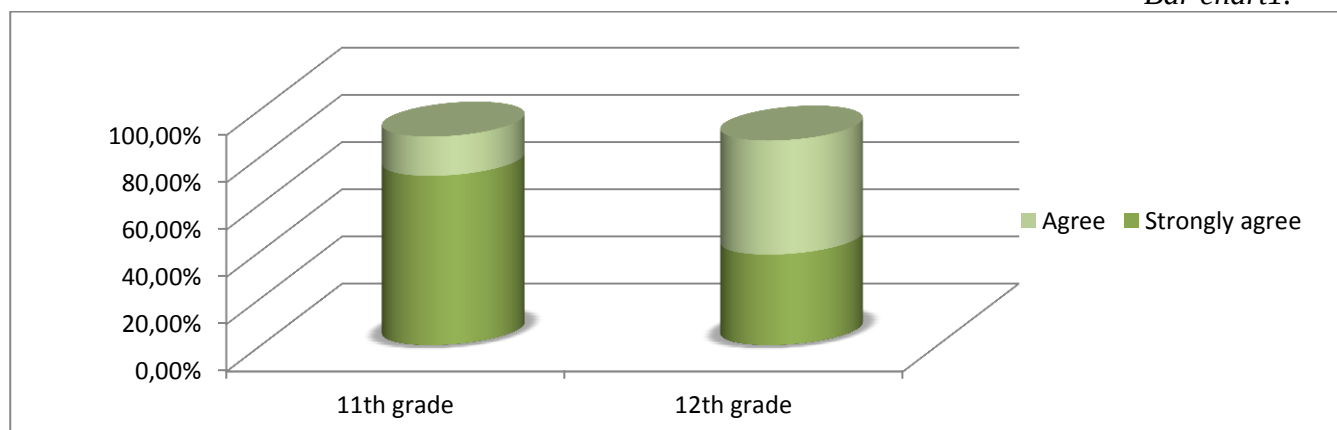
The percentage of students Selecting illnesses caused by IAP

Table 3

Illnesses/Grade	11 th grade	12 th grade
Lung cancer	70%	83,33%
IQ loss	20%	5%

IAP as a problem in KZ

Bar chart1.



Personal interview showed that not only coal combustion and industries, but also transport is a significant cause of air pollution. All six interviewee have chosen those two causes and transport. One interviewee said that “In my point of view the significance of causes of air pollution depends upon on the place. For example in Temirtau coal combustion and generally industries are the most important causes of air contamination, while in Almaty both transport and industrial facilities are considered to be the causes of air pollution”.

Another interviewee has chosen all the options as illnesses which can be caused by IAP. When he was asked why he did so, and then answered: “Humans` organism, as so as all alive organisms is dependent on the environment. If the quality of air will be low, then our organism will suffer from it. What is more, all processes which take place in our body are related to each-other. For instance, if we will breathe polluted air, pollutants will go to our lungs, then they will enter our internal organs with the help of blood flow”.

Generally, both personal interview and survey revealed that most of the respondents are aware of consequences linked to IAP and majority of them think that in Kazakhstan IAP is a problem.

According to the results and data it is possible to draw a conclusion for each of the research questions.

How adolescents are aware of industrial air contamination in China?

Most of the respondents are aware of industrial air contamination which is taking place in China. What is more 75% percents of surveyors know that 16 out of 20 worlds` most polluted cities are located on that country, it means that they know that IAP is considered to be a significant problem in China. If most of surveyors know it then it can create an assumption that majority of Kazakhstanis` adolescents are aware about air pollution of China.

What are the consequences of IAP on humans` health?

Coal combustion leads to emissions of harmful chemicals, such as carbon dioxide and suspended dust particles into the atmosphere. It can lead to several health problems such as lung cancer, bladder cancer, respiratory illnesses, heart disease, stroke and IQ loss. What is more, IAP leads to ultimately death.

How aware youth are about effects of IAP on health?

Most of adolescents know that IAP can lead to lung cancer and heart disease; however, just few of them know that IAP can lead to IQ loss. It means that they are not fully aware about illnesses which can be caused by IAP. Roughly all the respondents know that small particles are harmful to humans` health. Generally, we can make an assumption that more than the 70% of Kazakhstanis adolescents is aware about health effects of IAP.

What do youth think about IAP in Kazakhstan?

Most of the surveyors reported that IAP is considered to be a problem in Kazakhstan. Additionally, major part of the respondents thinks that the rate of IAP pollution in Kazakhstan is likely to increase in the future. It means that in their opinion the quality of air in Kazakhstan can get worse.

The results can be partially generalized to whole Kazakhstan`s youth. According to the results of this research we can draw a conclusion that the majority of Kazakhstan`s adolescents are aware about consequences of IAP on humans` health. What is more, youth think that the quality of air in Kazakhstan will reduce. So, we can make an assumption that our future generation may be interested in finding new ways for reducing IAP rate.

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ТАБИҒИ МАТЕРИАЛ АРҚЫЛЫ МҰНАЙМЕН ЛАСТАНҒАН ТОПЫРАҚТЫ ТАЗАРТЫП, ҚҰРЫЛЫС МАТЕРИАЛЫ РЕТІНДЕ ҚОЛДАНУ

Айтмағанбетова Ж.Т., Төлеубекова А.Е., Карипова А.Т.

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Аңдатпа

Мақалада топырақты мұнай және мұнай өнімдерінен тазалауда табиғи материалды пайдалана отырып, алынған өнімді құрылыс материалы ретінде қолданылуы қарастырылған.

Негізгі сөздер

Топырақ, мұнай, жүн, сорбент, сорбция

Бүгінгі таңда көптеген мемлекеттердің, соның ішінде Қазақстанның экономикасының тұрақты дамуы ресурстарға, ең алдымен мұнай потенциалына тәуелді. Мұнайды өндірудің