Fig. 1. – Kinetics of the degradation of caffeine MO under UV-irradiation

BIBLIOGRAPHY


ASSESSMENT OF POLLUTION SOURCES AND SURFACE WATER QUALITY IN MINSK

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The study considers the main sources of pollution of surface water bodies of Minsk and pollutants. Based on the analysis of the data of the National Statistical Committee and the Ministry of Natural Resources and Environmental Protection, the purpose and objectives of the ongoing master’s study are formulated.

Keywords: pollution, water pollution, surface water, water monitoring, automobile transport, transport, oil.

At the present stage of development of society there is a problem of getting into the environment of the substances and elements not characteristic for its natural state. With the increase in urbanization, expansion and consolidation of the road network of the city of Minsk, one of the types of anthropogenic impact on surface water bodies was the influence of various types of chemicals entering the water from vehicles.

The main focus of the research is aimed at assessing water pollution from vehicles. The complexity of the assessment is due to the lack of certain places where the potential pollutant enters the water, i.e. the source is not clearly differentiated in space and the pollutant enters and is distributed diffusely in the water by flushing from roads directly or through the system of urban storm sewers.

According to the National Statistical Committee of the Republic of Belarus, the number of cars in personal use of citizens of the Republic from 2015 to 2018 has increased by more than one hundred thousand units t (most of which were passenger vehicles). For the city of Minsk, at the end of 2018, the total number of cars was more than six hundred thousand units, which is 1.5 cars for every third resident of the city [1]. In this regard, due to the large number of cars in the city, there is a need to assess the quality of surface water bodies of Minsk, which are under anthropogenic load.

Pollutants from automobile transport that may get into water: hydrocarbons and products of their combustion (in particular, petroleum products, aromatic hydrocarbons, benz (a) pyrene), nitrogen compounds, sulfur com-
pounds, heavy metals, etc. These substances have a serious anthropogenic impact on the inhabitants of river and coastal flora and fauna, as well as hydro chemical processes occurring in the reservoir.

The main surface watercourse in the city of Minsk is the river Svisloch and its tributaries. To assess the quality, it is necessary to analyze water samples in the places of the most likely accumulation of pollutants (parts of the watercourse with a slow flow, small bays). It is particularly important to carry out post-precipitation analysis due to the increased movement of contaminants through storm drains and simple runoff from the surface of roads. The primary step in the analysis should be an express test for the presence of specific pollutants. With positive qualitative identification, it will be possible to proceed to the second stage of sampling. The second stage involves a more detailed laboratory analysis. Thus, it will be possible to propose a methodology for reducing sampling by eliminating samples without a pollutant.

According to hydrobiological monitoring of surface waters of the National environmental monitoring system, in 2018 the Svisloch River was given the status of very dirty below the city of Minsk in the village of Korolishchevichi, and in the reporting period for 2018, cases of exceeding the standard of quality of oil products were recorded. This also provides grounds for a detailed analysis of anthropogenic pollutants [2].

The main tasks that need to be solved: to assess the pollution of surface water in Minsk, to identify the main pollutants entering the water in places of their most likely accumulation.

**BIBLIOGRAPHY**


**INVESTMENT ATTRACTIVENESS OF AGRICULTURE OF PAKISTAN**

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Agriculture is heavily contributing towards the economy of Pakistan. Water deficiency and drought conditions, long duration load shedding issue, poor extension services, absence of land reforms, absence of distribution of certified varieties, high price of fertilizers, deliberate use of adulterated, non-recommended and expired insecticides, non utilization of cultivable waste land, conventional farming practices, indirect access of farmer to main market, absence of ecological based cropping pattern, smuggling of agricultural inputs and outputs, lack of cooperation between agricultural research, education & extension services, absence of crop insurance, depletion of forests, lack of modern post-harvest technologies and disease outbreaks of poultry birds are some of the key issues that are playing a negative role in demotion of agricultural sector in Pakistan. The review article will briefly discuss the mentioned issues and some of the possible remedies for the environment of Pakistan and their adoption to improve the agricultural productivity in the country.

**Keywords:** agriculture; Pakistan plant Issues.

Pakistan is an agricultural based country and out of 80 Mha of the total land, 22 Mha is being utilized for the agricultural production. Significant increase in the cropping area has been observed over the last three decade as the cropping area increased from 16,62 Mha to 22,15 Mha during the period of 1971 to 2003 but due to the rapid increase in the population, per capita land availability has drastically decreased. The projected annual growth rate is depicting a worse picture in the near future with respect to agricultural economy. Economy of the country is resting on the shoulders of agriculture sector. With a contribution of 21 % in GDP and employment of more than 48,4 % of the total working force, this sector is the biggest contributor in the economy of the country. Cropping sector has 60 % of the total agriculture contribution to the GDP while the livestock and forestry accounts for 40% (Government of Pakistan, 2011). Agriculture sector in Pakistan is also facing some of the most serious issues and there is a need to highlight and solve these issues at first priority.

Supervisor: Prof. Dr.