the special role it plays in protecting all living organisms from the effects of the dangerous ultraviolet (UV) radiation from the sun. In the same way, its wide absorption range also includes the lethal radiation of 240–280 nanometers for all life on Earth. Atmospheric ozone has been particularly active in recent decades.

For the first time, a rupture in the ozone layer of the Earth's atmosphere (more than 1000 km) emerged in the 1980s over Antarctica, where a slow but steady decline in stratospheric ozone from year to year is occurring. In this context, this phenomenon has been called the "ozone hole".

The main mechanism for ozone depletion that results in ozone holes is expected to be a catalytic cycle involving nitrogen oxides.

There are two main types of nitrogen oxide sources in the stratosphere: natural and man-made. The first is caused by bacteria (in nature, nitrogen oxides are formed in the form of N2O oxide during the bacteria living), and the second source, various kinds of man-made gases, as well as gases generated by nuclear explosions.

Ozone are also represented by Freon and halocarbon (saturated fluorocarbons or polytherapeutic, often containing chlorine or bromine atoms). These substances are not formed naturally, not toxic, not volatile, and, in small doses, even harmless for humans. But at the expense of turbulence in the atmosphere, they end up in the stratosphere, where the ultraviolet sun is disrupted by the formation of chlorine, which can interact with ozone to obtain chlorine monoxide and, in turn, with an atomic Oxygen, resulting in atomic chlorine and diatomic oxygen. As a result, atomic chlorine is regenerated and acts as a catalyst for the basic reaction of ozone depletion. In this case, one chlorine atom can participate up to 105 times in reaction of the dissimilation of the ozone molecule. This catalytic cycle is expected to include not two as previously thought, but about 40 reactions involving CL, SLO, HCL, NOSL, Hclno2, and many other chlorine compounds.

In Antarctica, this process takes place in special conditions, the isolated polar vortex, where there is no air mass exchange during the entire polar winter and spring. When sunlight is appearing in the stratosphere, photochemical processes of impurities are beginning to occur and, as a result, ozone molecules are being destroyed in response to the reactions discussed above. By the middle of spring, the polar vortex is crumbling and the hole begins to "tighten".

The thing is that the weakening of the ozone layer increases the flow of solar radiation to the earth and causes the risks of cancer, as well as the loss of plants and animals.

While mankind has taken measures to limit the emission of chlorine and bromine-containing CFCs by switching to other substances, such as fluorinated Freon (Vienna Convention on the Protection of the Ozone Layer, adopted on 22 March 1985), the process of recovery of the ozone layer will take several decades. But science never knows what processes are exactly destroying the ozone layer, so where the ozone hole will lead to, the further research will show it.

Science has not yet fully established what the main processes that violating the ozone layer are. Searching for an accurate response to a given nature the issue gave rise to a wide range of views on the mechanism for the creation of the ozone hole and its impact on our planet, from full complacency to the prediction of the ozone catastrophe. What is true between these extreme points of view: the truth or a new issue – will be shown by further research.

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LACCASE INDUCED WATER PURIFICATION TO REMOVE 3,3’- DIMETHYLBENZIDINE (O-TOLUIDINE)

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The object of the study was enzyme laccase from the mycelium Pleurotus ostreatus. At the first stage of the study, the optimal conditions for the oxidation of 3,3'-dimethylbenzidine by the enzyme laccase were determined. At the second stage, the removal of the products of the enzymatic reaction from water was carried out.

Keywords: benzidine, carcinogenic, toxic, laccases, enzymes destruction.

Benzidine is an artificially produced chemical compound that was broadly used in industry and agriculture. It is known as a dangerous chemical for human health mostly because of causing cancer. In the environment benzidine could be transformed into several other chemical compounds such as 3,3'- dimethylbenzidine (o-toluidine) that is highly carcinogenic and toxic [1]. However the products of 3,3'- dimethylbenzidine degradation could be more toxic than the original substance that demands their urgent inactivation.

Despite the fact that benzidine and 3,3'- dimethylbenzidine are not highly water soluble there is a necessity of water purification in case of contamination. Enzymatic method is one of the most effective for this purpose and laccases (E.C.1.10.3.2, p-benzenediol:oxygen oxidoreductase) could be an appropriate enzymes for 3,3'- dimethylbenzidine destruction [2].

We investigated the effectiveness of intracellular laccase isolated from mycelium of *Plerotus ostreatus* [3] for the purpose of 3,3'- dimethylbenzidine degradation in water. During the first stage of the study the optimal conditions for 3,3'- dimethylbenzidine oxidation such as pH within the range 4.5–5.0; temperature 50–60^{0} C and concentration of compound 1-1.5 mM were determined.

During the second stage elimination of the enzymatic reaction products was done using an absorption chromatography which allowed the level of specified water purification within the range of 97–99 %.

Our results demonstrate a good ability of proposed method for benzidine compounds removal from water.

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PROTECTION OF PEOPLE LIVING IN LONG-TERM CONTAMINATED AREAS AFTER A NUCLEAR ACCIDENT OR A RADIATION EMERGENCY

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The International Commission on Radiological Protection (ICRP) is the main agency for protection from radiation ionization. The commission considers the impact of ionizing radiation on the people living in long-term contaminated areas, as well as practical aspects of the protection strategy both the authorities and the affected communities.

*Keywords:*Post-accident; Rehabilitation; Optimisation; Reference level; Effective residual dose; Radiation emergency; Contaminated sites; Contaminated foodstuffs.

The International Commission on Radiological Protection (ICRP) Publication 111 "Application of the Commission's Recommendations to the Protection of People Living in Long-term Contaminated Areas after a Nuclear Accident or a Radiation Emergency"provides guidance for the protection of people that living in long-term contaminated areas after a nuclear accident or radiation emergency. Also this Publication considers the effects of such events on the affected population, for example the pathways of human exposure, the types of exposed populations, and the characteristics of exposures. Although the focus is on radiation protection considerations, the report also recognizes the complexity of post-accident situations, which cannot be managed without addressing all the affected domains of daily life, i.e. environmental, health, economic, social, psychological, cultural, ethical, political, etc. The report explains how the 2007 Recommendations apply to this type of existing exposure situation, including consideration of the justification and optimisation of protection strategies, and the introduction and application of a reference level to drive the optimisation process [1].

At its meeting in Paris in March 2005, the Main Commission of the ICRP approved the formation of a new Task Group, reporting to Committee 4, to develop guidance on the implementation of its new Recommendations (ICRP, 2007) for the protection of people living in long-term contaminated areas after a nuclear accident or a radiation emergency. The terms of reference of the Task Group were to provide guidance on:

- setting reference levels for planning long-term protection strategies;
- implementing optimised protective actions;
- involving stakeholders in radiological protection;
- developing radiation monitoring and health surveillance; and
- managing contaminated commodities.