



ROLE OF GLUTATHIONE IN THE PHOTOCHEMICAL SELF-PURIFICATION PROCESSES OF WATER SYSTEMS

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The purpose of the research is to highlight the influence of glutathione on the processes of natural waters self-purification.

It is well known that glutathione has many important biological functions such as detoxifying, antioxidant, strengthens body's own immune system, etc. In this work they were studied photochemical transformations of glutathione on the model systems. Glutathione (GSH) was subjected to the direct photolysis, induced photolysis with OH radicals, generated by H₂O₂, and sensitized photolysis with humic substances, to the irradiation with different sources of artificial light in the presence and absence of copper ions Cu(II). As the light source were used: UV lamp that emits monochromatic light with $\lambda = 254$ nm and $\lambda = 365$ nm and Solar Simulator, Oriel Model 9119X, with three different filters, that allowed studying the influence of the Solar radiation on the chemical transformations of the thiols. The kinetics of oxidation process of GSH was studied by means of spectrophotometric method, according to glutathione consumption, using Ellman's reagent.

From the experimental results it has been found that glutathione is subjected to the direct photolysis, induced photolysis with OH radicals and sensitized photolysis with humic substances and the oxidation speed depends directly proportional to its concentration in the system, but more pronounced to the concentration of oxidant and of copper ions and of the quantity and quality of emitted radiation. It was demonstrated that the rays emitted by the sun can initiate photochemical transformations of glutathione in the natural waters.

To determine the self-purification process in the presence of glutathione was used the method with competing reactions, using the dye of para-nitroso-dimethylaniline (PNDMA), possessing the "trap" properties for the OH radicals. It was demonstrated formation of OH radicals in the model systems, the concentration of which increased with increasing of substrate, H₂O₂ and of copper ions (Cu (II)) concentrations. The experimental results showed that glutathione on the one hand, adversely affect the self-purification capacity of the natural water, by the consumption of H₂O₂ and the binding of the transition metal in the stable compounds complexes and, but on the other hand, lead to an increase in the concentration of OH radicals in the process of photolysis.