

INFLUENCE OF H₂O₂ ON THIOUREA PHOTOCHEMICAL TRANSFORMATIONS IN THE PRESENCE OF Cu(II) AND Fe(III) IONS IN AQUATIC SYSTEMS

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Thiourea (TU) is a substance of anthropogenic origin in aquatic systems, which has reducing properties, respectively directly influences their self-purification processes. At the same time, TU has a toxic influence on hydrobionts, by inhibition their activity. This researches were performed in order to establish the kinetic parameters and phototransformation mechanisms of TU in aquatic systems in the presence of H₂O₂, as an artificial source of OH radicals, in the absence and presence of Cu(II) and Fe(III) ions, as catalysts.

The researches were performed on model systems, and the concentrations of the components added to the system were selected in such a way as to model situations as close as possible to the real situations of the aquatic systems. As a radiation source was used the Solar Simulator, Oriel Model 9119X, equipped with three different filters, which simulate the quantity and quality of solar radiation, which reaches the ground. The research results have shown that TU undergoes photochemical transformations with H₂O₂, on irradiation with the mentioned artificial radiation sources. It was found that the rate of TU transformation depends and increases with increasing of its concentrations, of H₂O₂ concentrations like as of Cu(II) and Fe(III) ions concentrations added to the system. At the same time, it has been found that the rate of TU photochemical transformation also depends on the quality and quantity of used radiation. It has been found that TU leads to complexation of the Cu(II) and Fe(III) ions into stable complex compounds, thus excluding them from the aquatic systems. It was determined that, in aquatic systems, TU will undergo photochemical transformations according to the radical and very complex mechanisms. So we can conclude that TU has a negative influence on the aquatic systems, because on the one hand it consumes oxidative equivalents, and on the other hand it excludes Cu(II) and Fe(III) ions, which act as catalysts in aquatic self-purification processes.

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