

SENSITIZED PHOTOLYSIS OF THIOGLYCOLIC ACID IN AQUATIC ENVIRONMENT

Angela Lis ^{a*}, Viorica Gladchi ^a, Gheorghe Duca ^b, Sergey Travin ^c

^aFaculty of Chemistry and Chemical Technology, Moldova State University,
60, Alexe Mateevici str., Chisinau MD-2009, Republic of Moldova

^bInstitute of Chemistry, 3, Academiei str., Chisinau MD-2028, Republic of Moldova

^cSemenov Federal Research Centre for Chemical Physics of the Russian Academy of Sciences,
4, Kosygina str., Moscow 119991, Russian Federation

*e-mail: angelalis85@yahoo.com

Abstract. It is known that thioglycolic acid (TgA) is widely used in industry and, unlike many other thiols, has a negative influence on organisms, similar to cysteine (Cys). The goal of this work was to study the TgA photochemical transformations in waters using model systems and to determine the kinetic parameters by varying the irradiation sources. It was found that TgA undergoes destruction on induced photolysis in the presence of humic substances (HSs), and its half-life can be estimated as 10-14 days, depending on weather conditions (cloudiness, time of day, season *etc.*). Results obtained in the course of this study on model systems were transferred to natural waters, and it was concluded that TgA has a positive influence on the chemical self-purification processes of water, in the natural aquatic environment. This is manifested by increasing the self-purification capacity of water, due to the generation of active oxygen species (ex.: $O_2^{\cdot-}$, $\cdot OH$, 1O_2), which lead to the degradation not only of this thiol, but of other pollutants present in aquatic environment, as well. At the same time, the products of the transformations are harmless to the aquatic environment and hydrobionts.

Keywords: photochemical transformation, thioglycolic acid, humic substance, kinetic parameter, natural water.

Received: 05 January 2021/ Revised final: 09 March 2021/ Accepted: 15 March 2021
