

IMPACT OF THE UV LAMP POWER ON THE FORMATION OF SWIMMING POOL WATER TREATMENT BY-PRODUCTS

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Abstract

The operation of swimming pools requires a constant monitoring of water quality parameters and protection of water against pathogens. This is implemented by various disinfection methods, among which the most commonly used are based on chlorine action supported by ozone or UV irradiation. The paper presents the comparison of the effectiveness of organic micropollutants decomposition occurring in swimming pool water during UV irradiation emitted by a 15 and 150 W UV lamp. The tests were conducted on real swimming pool water collected from a sport basin. The identification and the determination of micropollutants concentration were performed by the use of gas chromatography GC-MS (EI) preceded by solid-phase extraction SPE. It was shown that the concentration of micropollutants decreases with the increase in the irradiation time of pool water. The 150 W UV lamp allowed for an over 33% removal of micropollutants from the group of pharmaceuticals compounds (except for caffeine) and more than 76% decrease of other compounds, which belong to the group of personal care products additives, food additives and phthalates. In addition, it has been demonstrated that during the irradiation of such complex water matrixes as swimming pool water, a significant number of micropollutants degradation by-products were formed, which are not found in water before UV irradiation.

Keywords: Swimming pools; Micropollutants; UV lamp; Disinfection.