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APPLICATION OF A STOICHIOMETRIC MODEL FOR QUANTIFYING TRIHALOMETHANE FORMATION IN DRINKING WATER.

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ABSTRACT

A modelling procedure with a time discretisation of one minute is developed in order to study and simulate the kinetics of formation of total Trihalomethanes (TTHM) in water treatment plants. This methodology was applied on two significant processing units of Athens (Galatsi Treatment Plant-GTP, Menidi Treatment Plant-MTP). The fundamental concept of the model was based on the representation of the water treatment plant as a mixed flow reactor, where the formation of TTHM was predicated on a generalised reaction of total halogens with an organic precursor. Differential rates of reactants and products were expressed in terms of the reaction stoichiometry. The most appropriate coefficient set was sought and it was found that a stoichiometric ratio of 0.5 for total halogen, 0.6 for organic substrate and 0.2 for TTHM resulted in the best fit between simulated and experimental data. The present modelling approach should be considered as a promising methodological basis towards the realistic reproduction of the dynamics of water treatment plants and the development of reliable numerical tools for the accurate prediction of THM formation.