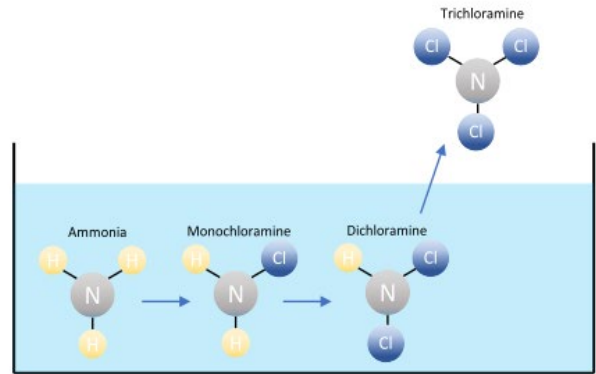


Modelling Electrochemical Reactions in Swimming Pool Water



Background

Swimming pools are popular all over the world. Continuous disinfection of the pool water, usually with chlorine, is crucial to maintain a healthy environment for the bathers. However, a disadvantage with chlorination is the formation of unwanted by-products. Over 100 different by-products have been identified in pool water, where trichloramine (NCl_3) is of particular concern. This volatile compound has a penetrating odor and several adverse health effects, such as asthma, eye irritation and skin irritation, have been reported and assumed to be caused by trichloramine.

Safewater Scandinavia has developed an electrolysis system to reduce the trichloramine concentration in pool water. A voltage is applied between two MMO electrodes, where one works as anode and the other as cathode, in order to drive non-spontaneous chemical reactions. The electrochemical cell is installed in the pool circulation system with a certain flow rate of the pool water.

Project description

The purpose of this project is to model the chemical reactions in the electrochemical cell, and investigate how parameters such as electrode surface area, electrode length, and geometry of the electrochemical cell affect the reactions in order to optimize the system. The flow mechanics in the cell, and how it affects the trichloramine reduction, is of particular interest. The project is carried out at Chalmers in collaboration with Safewater Scandinavia.

Contact information

For more information and/or to apply, please contact Associate Professor Henrik Ström at the Division of Fluid Dynamics (henrik.strom@chalmers.se or 031-772 13 60).