

The phenomenon of cavitation is currently one of the most researched processes to support many classical approaches used in chemical and environmental engineering. The ability to concentrate high energy and pressure while significantly increasing mass transfer, mainly through the formation of microcirculations, has already been utilized for water and wastewater treatment in advanced oxidation processes (AOPs) based on cavitation.

Currently, most studies focus on typical venturi or orifice cavitation systems. In contrast, the current project relates to unique studies on cavitation phenomena taking place in micro-channels and micro-channel arrays that allow to intensify cavitation effects by taming cavitation bubbles in controlled environments in multiple parallel lines.

A detailed research plan includes tasks related to the design and characterization of such cavitation zones and fundamental research on cavitation phenomena occurring in such systems.

Several important insights will be gained during this project that will have a strong impact on future studies in this area. These include the knowledge and visualization of cavitation occurring in micro-channels and chemical engineering approach to describe and optimize the phenomenon, and the description of the mechanisms of oxidant's activation, radical's formation, and organic pollutant degradation.

The results of this project should also be useful for further studies on the application character of microchannel cavitation.