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 Water Technology

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## Funding body:

 Guangzhou Elite Project

## Area (field) of study:

Bio-electro-Fenton process for removal of micro-pollutants in water

## Thesis Title:

Bio-electro-Fenton process for removal of micro-pollutants in water: Optimization, mechanism and amplification

## Abstract:

 Water contamination by pharmaceutical may cause serious diseases to human beings, which makes a priority issue worldwide in recent years. Biological processes are the most widespread methods in many urban water treatment facilities, the state of the art being conventional activated sludge (CAS). However, they do not provide satisfactory results for the destruction of persistent/recalcitrant contaminants, since many of them are toxic or resistant to microorganisms.

Recently the combination of the electro-Fenton process with bioelectrochemical processes such as microbial electrolytic cells (MEC) has been suggested as a promising alternative solution. The process has been recently named as bio-electro-Fenton process. Bio-electro-Fenton shows several advantages in relation to the chemical and/or electro-chemical Fenton processes. However, there are still challenges such as low recycling efficiency of iron, low hydrogen peroxide production rate and long reaction time in bio-electro-Fenton system.

In order to meet the needs of pilot-scale research, novel reactor will be developed from the point of view of system design in this project. Firstly, starting with laboratory studies to address possible problems with these reactors, such as pH and the efficiency of iron cycling. Secondly, the reactor that combines different functions will be run. And the efficiency of the reactor will be improved by electrode modification. Finally, the system will be scaled up, and the problem that appears in actual operation will also be solved.

## Publications:

Wang G, Zhao D, Kou F, et al. Removal of norfloxacin by surface Fenton system (MnFe2O4/H2O2): Kinetics, mechanism and degradation pathway [J]. CHEM ENG J, 2018, 747–755.

Wang G, et al. Progress of the removal technologies for micro-pollutants from rural drinking water. Guangdong Chemical Industry, 2017, 44(4):86-88.