

## Electro-flotation process for the wastewater recycling

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Electro-flotation is a type of bubble columns. It is the electrochemical version of traditional dissolved air flotation. It is characterized by its mechanism of oxygen and hydrogen bubble formation due to water electrolysis. Electro-flotation presents several advantages: Silent process which does not require large amount of energy, high removal efficiency of suspended solids, high COD abatement rate by native oxygen bubbles formed at the anode, possible control of mass and size of bubble produced by simple adjustment of current density and possible use of solar energy as a power source. In this context and as a first step, our research team focused on electro-flotation as water treatment process. Many applications were performed successfully on real industrial wastewaters with good results in both batch and continuous regime. Theoretical study of oxygen transfer and also bubble hydrodynamics in such bubble unit is therefore very useful to optimize the process of electro-flotation. In this context, several studies also focused on different parameters which affect the mass transfer coefficient  $K_La$  such as agitation, temperature, nature of the regime (batch or continuous), current density applied to the electrodes of the unit. These studies allow us to better understand and optimize the phenomena of oxygen transfer. On the other hand, the effect of physicochemical characteristics of liquid phase on the hydrodynamics of the unit was also done. Of course, the knowledge and characterization of hydrodynamics are essential for several reasons. In fact, identifying areas of transition between laminar and turbulent regime can help us to optimize the process in case of use as water treatment process. In addition, the knowledge of hydrodynamic parameters such as bubble diameter or gas retention will also allow a better understanding of mass transfer phenomena.

### Biography

Ben Mansour has completed his PhD in Chemical Engineering Process from University of Chemical Technology - Mendeleev -Moscow in 1995 and the Academic Empowerment in Chemical Engineering-Processes from the University of Gabes, Tunisia in 2007. His subject area and expertise is units operations, bubble hydrodynamics and transfer in the electroflotation column. He is affiliate in Research laboratory of Applied Fluid Mechanics, Process Engineering and Environment - Science Faculty of Sfax Tunisia. He has published more than 20 papers in reputed journals and has been serving as reviewer for many journals in chemical process area.

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