

Chemistry Department

Wastewater Treatment and Valorisation

Biochemical and Process Engineering Group
<http://www.dq.fct.unl.pt/pessoas/investigadores/adrian-michael-oehmen>



Adrian Oehmen

Researcher, since 2009

- Editor of International Journal - Water Science and Technology
- Management Committee member of
 - 1) IWA MEWE Specialist Group
 - 2) COST ES1202 Action
- PhD in Chemical Engineering (2005)
- Total Articles = 48
- Sum of Times Cited = 1205
- Average Citations per Article = 25
- 'h' index = 16

Objectives

Wastewater and drinking water treatment processes, including:

- Biological nutrient removal (Phosphorus and Nitrogen)
- Pharmaceuticals and personal care products
- Heavy metals and pesticides

Resource recovery from wastewater in the form of valuable products, including:

- Bioplastics (Polyhydroxyalkanoates – PHA)
- Fertilizers (rich in Phosphorus)
- Bioenergy (e.g. Methane)

Sustainable operation of wastewater treatment plants, including minimising greenhouse gas (GHG) production and more cost-effective treatment techniques

Methodology

Reactor Engineering Techniques

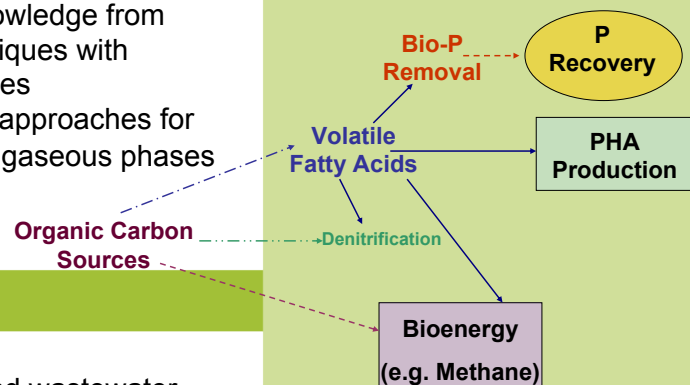
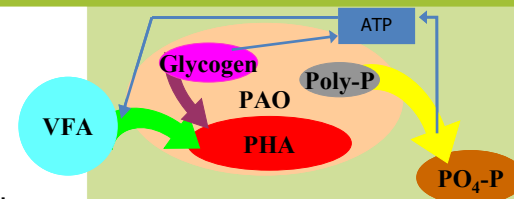
- Mixed culture bioreactors
- Integrated membrane bioreactors
- Physical/chemical treatment

Analytical Tools:

- Combining knowledge from molecular techniques with chemical analyses
- Mass balance approaches for solid, liquid and gaseous phases

Mathematical Modelling Techniques

- Metabolic model development
- Wastewater treatment modelling
- Stoichiometric and Kinetic analyses



Expected Results

- Optimisation of macro- and micro-pollutant removal from water and wastewater
- Novel production routes of value-added products from wastewater
- New operational strategies for minimising GHG production and lowering costs
- Increased knowledge regarding metabolic mechanisms in wastewater systems
- Sustainable environmental protection and advances to the bio-economy

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PTDC/AAC-AMB/120581/2010 (PI)
PTDC/EBB-EBI/098862/2008
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PTDC/AMB/65702/2006
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SFRH/BD/74515/2010 (PS)
SFRH/BD/65113/2009
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