



**“Gheorghe Asachi” Technical University of Iasi, Romania**



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*Session 6*

**WASTEWATER VALORIZATION, BIOREMEDIATION, PURIFICATION AND REUSE**

*Main lecture*

**INDUSTRIAL WASTEWATER TREATMENT: INNOVATIVE AND INTEGRATED TECHNOLOGIES**

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**Abstract**

High or low pHs and temperatures, composition variations, mixture of different streams, high salinity, significant toxicity, are the main features, often occurring simultaneously, that make difficult the treatment of industrial effluents at conventional wastewater treatment plants. Accordingly, complex trains of treatment-technologies are necessary to meet the required quality limits and this entails: expensive installations, operational complexity, need of skilled technicians, high costs and, frequently, relevant environmental impact.

To tackle such problem it's necessary to distinguish between solutions on sector and factory level. On factory level it is essential to know which streams cause the complexity of the wastewater, what is the flow and composition, if separation is possible, etc.. As for sector level, a better insight in the problem can lead to common solutions, both on process level as well as in the area of treatment.

Pretreatments for improving wastewaters biodegradability, use of environmentally friendly alternative chemicals, streams segregation, wastewaters concentration, selective removal of toxic compounds are options that, case by case, could be implemented for contributing to mitigate the problem even though only innovative technologies could provide a definitive solution.

In this context, the European Commission co-financed the FP6 project “*Innovative and integrated technologies for the treatment of industrial wastewater*” whose acronym was *innowatech*.

The aim of the project, ended on 2010, was investigating, enhancing and assessing the potentiality of promising innovative technologies and processes aimed at tackling frequent and relevant problems encountered when treating industrial wastewater, such as: inefficient biological treatment lacking in operational flexibility and stability; high sludge production; occurrence of recalcitrant and/or toxic compounds impairing wastewater biodegradability; lack of technologies for selective removal or recovery of raw materials or priority organic pollutants; non-ideal combination of treatment options for specific processes.

The technologies investigated in the project were selected on the basis of their wide potentiality (i.e., aerobic granular sludge based systems, advanced oxidation processes integrated with biological treatment) for treating wastewaters whose properties (i.e., high biodegradable organic loads, concurrent presence of biodegradable and recalcitrant compounds) are common to many industrial sectors or because of their innovative treatment-concept (i.e., membrane contactors and membrane chemical reactors). As for the investigated wastewaters, they were representative of relevant industrial sectors (i.e., food, pharmaceutical, pesticides, chemical) or very complex streams such as solid wastes landfill leachates.

The presentation is aimed at outlining the main results of *INNOWATECH* recently published in a book.

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