

VLYSSIDES Apostolos, Professor



Graduating in chemical engineering from the National Technical University (NTUA) of Athens, Apostolos Vlyssides started his 30 year scientific career at NTUA in 1983, where he obtained his PhD degree in Environmental sciences in 1986 and was appointed professor in chemical engineering in 2004. Actually, he is teaching Design of Environmental and Clean Technologies and Industrial Engineering at NTUA.

For long time, his research activity has been focused on anaerobic digestion, starting with his PhD thesis on the mathematical modeling of anaerobic digestion in thermophilic region.

In the 1980s he became more involved in Environmental Biochemistry working on the aerobic and anaerobic biological organic carbon degradation methods for industrial liquid and solid wastes. In 1990s he became more and more involved in environmental detoxification methods using Advanced Oxidation Processes (AOPs). Then, in collaboration with industry, he developed oxidation processes based on electrochemistry and on fenton reactions. Applied research for the utilization of electro-fenton techniques by industry for the protection of the environment is a constant concern within his activities. In the 2000s he worked on more integrated processes using AOPs methods following by biological techniques using granular bed reactors in order to treat high polluted and toxic strength industrial wastewaters. Recent years he is working on design novel anaerobic and aerobic bioreactors in order to produce feasible energy from organic industrial residues reusing all the products and byproducts in a bio-refinery integrated system. His actual research work is focused on varying fields of applied environmental technologies such as chemical oxidation and biological degradation techniques as well as recycling and reusing techniques under clean technologies design concept.

Of all of his accomplishments, the greatest impact on environmental science and technology has been through the development and pioneering application of a novel anaerobic bioreactor design based on a granularity creation model where the ferrous cations and sulfates anions take the major place for granular growing up and the progress of the anammox process in parallel, and has been through development and pioneering application of high organic strength wastewater treatment method using a co-composting process with agricultural solid residues, and has been through the development of a model of organics anodic oxidation using Pt/Ti electrode where the presence of ferrous cations (electro-fenton) smooth over the molecular diffusion difficulties around the anode surface and its application to electrochemical treatment of high toxic wastewaters such as pesticides contain phosphorous and sulfurous or textile dyes

During the three decades of his academic career, Apostolos Vlyssides has published over 120 scientific papers, been granted 15 patents, and directed some 10 doctoral theses. Also he has participated in over 120 international and national symposia, giving numerous plenary lectures during the past years. Now days many industrial installations are working in Greece based on his inventions.

Selected Publications of last five years

Vlyssides, G. A., and Karlis K. P. (2004) Thermal-alkaline solubilization of waste activated sludge as a pre-treatment stage for anaerobic digestion. *Bioresource Technology*, 91(2), 201-206.

Vlyssides, G. A., Loizides, M., and Karlis, K. P. (2004) Integrated strategic approach for reusing olive oil extraction by-products, *Journal of Cleaner Production*, 12(6), 603-611

Vlyssides, A., Arapoglou, D., Israilides, C. and Karlis, P. (2004) Electrochemical oxidation of three obsolete organophosphorous pesticides stocks. *Journal of Pesticide Science (Tokyo, Japan)*, 29(2), 105-109.

Vlyssides, Apostolos, Barampouti, Elli Maria, Mai, Sofia, Arapoglou, Dimitris, Kotronarou, Anastasia (2004) Degradation of Methylparathion in Aqueous Solution by Electrochemical Oxidation. *Environmental Science and Technology*, 38(22), 6125-6131.

Vlyssides, Apostolos G., Mai, Sofia T., Barampouti, Elli Maria P. (2004) Bubble Size Distribution Formed by Depressurizing Air-Saturated Water. *Industrial & Engineering Chemistry Research*, 43(11), 2775-2780.

Vlyssides, A. G., Arapoglou, D. G., Israilides, C. J., Barampouti, E. M. P., Mai, S. T. (2004) Electrochemical treatment of methyl parathion based on the implementation of a factorial design. *Journal of Applied Electrochemistry*, 34(12), 1265-1269.

Vlyssides, A., Moutsatsou, A., Mai, S., Barampouti, E. M. (2005) Effect of oxidation pretreatment by hydrogen peroxide on iron removal from wastewater of a sulfuric acid iron-pickling process, *Environmental Progress*, 24(1), 82-87.

Barampouti, E. M. P., Mai, S. T., Vlyssides, A. G. (2005) Dynamic modeling of biogas production in an UASB reactor for potato processing wastewater treatment. *Chemical Engineering Journal (Amsterdam, Netherlands)*, 106(1), 53-58.

Vlyssides, Apostolos, Arapoglou, Dimitris, Mai, Sofia, Barampouti, Elli Maria (2005) Electrochemical detoxification of four phosphorothioate obsolete pesticides stocks. *Chemosphere*, 58(4), 439-447.

Vlyssides, Apostolos, Barampouti, Elli Maria, Mai, Sofia. (2005) Heavy metals removal from water resources using the aqua plant *apium nodiflorum*. *Communications in soil science and plant analysis*, 36(7 & 8), 1075-1081.

Vlyssides A., Mahnken G., Barampouti E M, Mai S. (2005) An easy way to transform nomographs and charts to a computer program, *Hydrocarbon Processing*, 84(9), 126-129.

Barampouti, E. M. P., Mai, S. T., Vlyssides, A. G. (2005) Dynamic Modeling of the Ratio Volatile Fatty Acids/Bicarbonate Alkalinity in a UASB Reactor for Potato Processing Wastewater Treatment. *Environmental Monitoring and Assessment* 110(1-3), 121-128.

Vlyssides, Apostolos, Arapoglou, Dimitris, Mai, Sofia, Barampouti, Elli Maria. (2005) Electrochemical oxidation of two organophosphoric obsolete pesticide stocks. *International Journal of Environment and Pollution*, 23(3), 289-299.

Vlyssides A., Barampouti E M, Mai S. (2006) Simplify wastewater treatment process design, *Chemical Engineering Progress*, 102(1), 42-46

Vlyssides A., Barampouti E.M., Mai S., Moutsatsou A. Effect of ferrous iron on the settling properties of granular sludge in a UASB reactor. *WIT Transactions on Ecology and the Environment* (2006), 92(Waste Management and the Environment III), 161-169.

Vlyssides A., Barampouti E.M., Mai S. Effect of ferrous ion on the biological activity in a UASB reactor. *Mathematical modeling and verification, Biotechnology & Bioengineering* (2007), 96(5), 853-861.

Vlyssides A., Barampouti E.M., Mai S. Energy utilization and recirculation of currant-finishing wastewater, *Journal of Hazardous Materials* (2007), 145, 506-510

- Vlyssides A., Barampouti E.M., Mai S. An alternative approach of UASB dynamic modelling, *AIChE journal* (2007), 53(12), 3269-3276
- Vlyssides A., Barampouti E.M., Mai S. Determination of granule size distribution in a UASB reactor, *Journal of Environmental Management* (2008), 86(4), 660-664
- Vlyssides A., Barampouti E.M., Mai S. Physical characteristics of olive stone wooden residues: possible bulking material for composting process, *Biodegradation* (2008), 19 (2), 209-214.
- Vlyssides A., Karlis P., Barampouti E.M., Mai S. Effect of recirculation of currant-finishing wastewater (CFW) on its composition, *Bioresource Technology* (2008), 99 (5), 1481-1485.
- Vlyssides A.G., Barampouti E.M.P., Mai S.T., Vlyssides A.A. Application of fenton's reagent on wastewater from a wood processing industry. *Environmental Engineering Science* (2008), 25 (3), 327-331.
- Barampouti E.M., Mai S., Vlyssides A. Granulation mechanism of a UASB reactor supplemented with iron. *Anaerobe* (2008), 14 (5), 275-279.
- Vlyssides A., Barampouti E.M., Mai S. Simple estimation of granule size distribution and sludge bed porosity in a UASB reactor, *Global NEST Journal* (2008), 10(1), 73-79.
- Vlyssides A., Barampouti E.M., Mai S., Stamatoglou A., Skouroumounis D. Fenton oxidation and biological treatment on pharmaceutical wastewater. *WIT Transactions on Ecology and the Environment* (2008), 109, 771-780.
- Vlyssides A., Barampouti E.M., Mai S. Influence of ferrous iron on the granularity of a UASB reactor, *Chemical Engineering journal* (2009), 146 (1), 49-56.
- Vlyssides A., Barampouti E.M., Mai S., Loukakis H., Loizides M., Inhibition kinetics of phenolic compounds in aerobic degradation of organic wastewaters. *Water environment research: a research publication of the Water Environment Federation* (2009), 81 (6), 587-591.
- Vlyssides A., Barampouti E.M., Mai S., Loukakis H., Influence of vegetation and gravel mesh on the tertiary treatment of wastewater from a cosmetics industry. *Journal of Environmental Science and Health, Part A* (2009) 44, 1-7.
- Vlyssides, A., Barampouti, E.M., Mai, S., Stamatoglou, E., Rigaki, K. Hydrolysis of starch using Fenton's reagents as a key for waste integrated management in a potato processing industry *Chemical Engineering Transactions* (2009) 18, pp. 165-170
- Vlyssides A., Mai S., Barampouti E.M., An integrated mathematical model for co-composting of agricultural solid wastes with industrial wastewater. *Bioresource Technology. Bioresource Technology* (2009), 100 (20), 4797-4806.