November 2011

RESUME

Full name: Ori Lahav
I.D. No.: 058315995
Date and place of birth: September 28, 1963, Haifa, Israel.
Marital Status: Married + 2
Web site: http://www.technion.ac.il/~civil/lahav/

Academic Degrees

1992 B.Sc., Water Engineering, Faculty of Agricultural Engineering, Technion - Israel Institute of Technology. *Cum Laude*
1994 M.Sc., Environmental Engineering, Faculty of Civil Engineering, Technion - Israel Institute of Technology.
1998 Ph.D., Environmental Engineering, Faculty of Agricultural Engineering, Technion – Israel Institute of Technology.

Academic Appointments

May 2008 - Present: Associate Professor, Faculty of Civil and Environmental Engineering, Technion, Israel Institute of Technology
March 2003 – April 2008: Senior Lecturer, Faculty of Civil and Environmental Engineering, Technion, Israel Institute of Technology
Sept. 2001 – Feb. 2003: Senior Research Associate, Faculty of Agricultural Engineering, Technion, Israel Institute of Technology
1999 – 2001: Post Doctoral Fellow, University of Cape Town, Department of Civil Engineering. Host: Prof. Richard Loewenthal.
1998 – 1999: Part-time Lecturer, Agricultural Engineering, Technion, Israel Institute of Technology
1995 – 1998: Senior Research Assistant, Agricultural Engineering, Technion, Israel Institute of Technology
1992 – 1994: Research Assistant, Civil Engineering, Technion, Israel Institute of Technology

Research interests

- Aquatic chemistry, focus on mechanism of processes.
- Water and wastewater process development.
- Desalination
- Aquacultural engineering from the aspect of water quality and water treatment processes.

Teaching Experience

Aquatic Chemistry (undergraduate level). Every other semester, since March 2003.
Chemistry of environmental processes (graduate level). Every other semester, since Oct. 2007.
Subsurface Drainage Engineering (undergraduate level). 2002 - 2006.
Urban Drainage Engineering (undergraduate + graduate level). 2002 - 2006.

Public Professional Activities

2004-2007 Member of both the Physical Quality and Water Treatment Sub-Committees of the Committee for the Revision of Potable Water Quality (Adin's Committee), Israeli

Ministry of Health (Author of the new Israeli criteria for quality of desalinated water).

2004-2008 Member of the Research Committee, Grand Water Research Institute.

2006-2008 Member of the Research Committee (Water and Soil Research), Ministry of Agriculture, Israel.

2007 Member of the Research Committee of BARD (US-Israel Bi-national Agricultural Research and Development Fund)

2008 - on Member of the Research Committee (Increasing water usage efficiency), Ministry of Agriculture, Israel.

Army Service (IDF): Armored forces. Release from active combat duty in 2005. Rank: Lieutenant Colonel.

GRADUATE STUDENTS

Completed theses

1. Alfia, Yuval. M.Sc. 2004. Investigation of the clogging mechanism, and development of operation parameters for a passive-aeration novel biological vertical bed.
2. Sagiv, Amitai. M.Sc. 2004. Modification, calibration and verification of a model depicting hydrogen sulfide emission rates in gravity sewers.
3. Klas, Sivan. M.Sc. 2005. Development of a cost effective and simple process for nitrate removal from intensive aquaculture systems by denitrification using intrinsic organic carbon source.
4. Firer Dan. M.Sc. 2006. Investigation of the use of iron salts to control odor and corrosion in urban sewer systems (co-supervision with E. Friedler).
5. Tsabar Mor. M.Sc. 2007. Removal of $NH_{3(g)}$ from broiler house emissions and its subsequence use as fertilizer.
6. Inbal Abraham. M.Sc. 2007. Development of a general method for calculation and allocation of river strips for a spatial drainage system.
7. Gendel, Yuri. M.Sc. 2007. Investigation of a chemical-biological process for H_2S removal from biogas emissions.
8. Iris Bar Massada. M.Sc. 2007. Study of the parameters that affect anaerobic ammonia oxidation (anammox) as part of a process aimed at complete removal of nitrogen species from recirculating aquaculture systems.
9. Liat Birnhack. M.Sc. 2007.
10. Somaya Falah. M.Sc. (2009) Deliberate struvite precipitation from the supernatant of sludge dewatering facilities for both phosphorus recycling and decrease in nutrients load on wastewater treatment plants.
11. Halil Eid. M.Sc. (2009). Calibration and implementation of "QUEST" method as a basis for developing a tool for the assessment of sewer exfiltration and its minimization (co-supervision with E. Friedler).
12. Naomi Levi. M.Sc. (2009) Investigation of the kinetics of low-pH ferrous oxidation by O_2 as part of a process aimed at $H_2S_{(g)}$ removal from biogas.
13. Liat Birnhack. Ph.D. (2010) Development and modeling of a cost effective and advantageous post treatment process for desalinated water.
14. Klas Sivan. Ph.D. (2010) Removal of heavy metals by their stable incorporation into ferrites at ambient temperature: process development and modeling.
15. Elya Ofer M.Sc. (2010) Stabilization of the ferrite crystal as part of a process aimed at heavy metals removal from industrial wastes at ambient temperature.
16. Noga Fridman. M.Sc. (2010) Minimization of bromate formation as part of the operation of a non-thermal-plasma method for oxidation of refractory organic compounds.

17. Mizrahi Anat. M.Sc. in Tel Hay College. (2011) Removal of Methyl Tert-Butyl Ether (MTBE), Trichloroethylene (TCE) and Azo dye from drinking water by a new Plasma-based Advanced Oxidation Technology: A kinetics study. Co-supervision with I. Tal-Or.
18. Shaul Oren. MSc. (2011) Development of a post treatment process for magnesium addition to inorganic carbon rich desalinated brackish water.

Theses in progress

19. Yuri Gendel Ph.D. Revealing the mechanism of indirect ammonia electrooxidation. Expected graduation: December 2011.
20. Marina Telzhensky, Ph.D. Selective separation of Mg^{2+} from seawater via ion-exchange assisted nanofiltration: process development and determination of controlling ion-separation mechanisms. Expected graduation: September 2013.
21. Amir Zivan. MSc. Development of a Cost Effective and Environmental Method for Commercial Breeding of Mullet Fish (Mugil cephalus) in Low-Salinity Waters. Expected Graduation: October 2013.
22. Tali Klien. MSc. Development of an electrochemical process for regeneration of ion exchange resins used for ammonia removal in industrial processes. Expected Graduation: March 2012.
23. Oded Nir. PhD. Selective magnetic separation of Mg^{2+} ions from seawater by adsorption on magnetite crystals for reuse in water treatment processes. Expected Graduation: March 2014.
24. Yuval Shwartz. MSc. Development of a process for treatment of swine wastes using ion exchange and electrochemical regeneration. Expected Graduation: August 2012.
25. Ben Asher Raz. MSc. Development of a biological process for combined removal of nitrogen and phosphorus compounds from effluents of intensive aquaculture systems. Expected Graduation: August 2012.

SUPERVISION OF RESEARCH STAFF

Emily Shlafman (B.Sc.). October 2002 to October 2003.
Sharon Molchanov (M.Sc.). September 2004 to September 2006.
Sivan Klas (M.Sc.). January 2005 to September 2006.
Beni Lew (Ph.D.). April 2007 to April 2008.
Adina Moshe (M.Sc.). October 2006 to December 2008.
Irina Zuev (Ph.D). Post doc, April 2009 – December 2009.
Liat Birnhack (Ph.D). Post Doc. March 2011 -

RESEARCH GRANTS (EXTERNAL SOURCES)

1. 2003 – 2006, Lake Kineret Drainage Authority, $75,000. Research on vegetated channels from both hydraulic and ecological perspectives (PIs: Shavit, Lahav, Carmel).
2. 2003 – 2004, Israel Oceanographic and Limnological Research Ltd., $5500. Development of a cost effective and simple process for nitrate removal from intensive aquaculture system by denitrification using intrinsic carbon source.
3. 2004 – 2007, BARD, $167,000. Elimination of Emissions of Ammonia and Hydrogen Sulfide from Confined Animal and Feeding Operations (CAFO) Using an Adsorption/Liquid-Redox Process with Biological Regeneration (PIs: Lahav, Broday).
4. 2005 – 2006, Haifa municipality + Keren Sapir: Prevention of odors and corrosion from gravity sewers – investigation into engineering and economical aspects. $32,000, (PIs: Friedler, Lahav).
5. 2005 – 2008, Min. of the Environment, Israel. $55,000. Calibration and implementation of "QUEST" method as a basis for developing a tool for the assessment of sewer exfiltration and its minimization (PIs: Friedler, Lahav).

6. 2005 – 2008, $111,000, Ministry of Agriculture: Monitoring of Recirculated Aquaculture Systems.
7. 2005– 2008, Ministry of Agriculture. Optimal management and maintenance of recirculated aquaculture systems. (PIs: Lahav, Mozes, Halachmi). Technion's part = $18,600 (out of $53,000).
8. 2005 – 2006, Israeli Water Commission office. $9,000. Theoretical investigation of the "Red Water" phenomenon.
9. 2006 – 2009, US-AID, MERC. Land-based Mariculture Wastewater Treatment - keeping the Red Sea clean. In collaboration with National Center for Mariculture in Eilat and Jordanian researchers from Aqaba. Technion's part (PI: Lahav) = 54,000$ (out of $500,000).
10. 2006 – 2008, Mekorot, $19,000, Studies into struvite precipitation from wastewater treatment plants.
11. 2007 – 2008. Gurwin Fund, $35,000. Development of a cost effective and advantageous post treatment process for desalinated water.
12. 2007 – 2010, BMBF-MOS, $170,000. Removal of heavy metals by their stable incorporation into ferrites at ambient temperature: process development and modeling, and application to wastewater from a plating and galvanization industries (PIs: Lahav, Dubovski).
13. 2007 – 2009. Mekorot. $70,000 Development of an analytical technique and investigation of odor removal from drinking water (PIs Dubowski, Lahav).
14. 2007 – 2009. Development of a novel cost effective post-treatment process for producing balanced nutrients composition and stabilized drinking water from desalinated and soft waters. Startup funding from private investors. In collaboration with Technion's R&D Foundation. Total startup sum: $1,400,000 for two years.
15. 2007 – 2008. Tahal. $17,500. Theoretical and empirical investigation into the effects of blending desalinated water with other water sources (With Dr. Ostfeld).
16. 2009. A novel process for removal of ammonia from piggery wastes. Renewable Resources Ltd. 150,000 NIS.
17. Minimization of bromate formation as part of a plasma-based process advanced oxidation technology. AquaPure Ltd. 50,000 NIS. 1.1.09 – 1.1.11.
18. 2009 – 2012. Assessment of Shamir well water for agriculture. 550,000 NIS. With Prof. Shaviv and Prof. Dozoretz.
19. 2010. Renewable Resources. $15,000. Continuation of the project "Development of a novel cost effective post-treatment process for desalinated water".
20. 2010-2011. Agri Ministry 279,000 NIS, RAS monitoring project (continuation).
21. 2010 – 2013 BARD. $155,000. Treatment of swine wastes (with Prof. Green).
22. 2010 - 2014 ISF. $185,000. Selective separation of Mg^{2+} from seawater via combined ion-exchange and nanofiltration while minimizing Cl^- concentration. With Profs. Dozoretz and Semiat.
23. 2010 – 2013 Ministry of Agriculture. 300,000 NIS. Promoting the cultivation of the Dakar fish species.
24. BMBF/MOS 2011-2012, 80,000 Euro. Extraction of phosphorus compounds from wastewater for reuse as struvite fertilizer, via dosage of cheap seawater-based Mg^{2+} ions, separated using a novel NF-based method (with Prof. Eisen).

PUBLICATIONS

Theses

Ph.D. Thesis: A physical-chemical-biological process for the removal of nitrogen compounds from secondary effluents (1998).
M.Sc. Thesis: Reuse of wastewater effluents in the urban sector in Israel (1994).

Refereed papers in professional journals

(467 and 397 citations in Scopus and ISI Web of Science, respectively; H index: 13)

1. Green M., Mels A., Lahav O., Tarre S. (1996) Biological - ion exchange process for ammonium removal from secondary effluent. *Wat. Sci. & Tech*. **34**(1-2): 449-458.
2. Lahav O. and Green M. (1998) Ammonium removal using ion exchange and biological regeneration. *Wat. Res*. **32**(7): 2019-2028.
3. Lahav O and Loewenthal RE (2000) Rapid communication. Measurement of VFA in anaerobic digestion: the five-point titration method revisited. *Water SA*, **26**(3): 389-393.
4. Lahav O. and Green M. (2000) Bioregenerated Ion Exchange Process: The Effect of the biofilm on the Ion Exchange Capacity and Kinetics. *Water SA*, **26**(1): 51-58.
5. Lahav O. and Green M. (2000) Ammonium removal from primary and secondary effluents using a bioregenerated ion-exchange process. *Wat. Sci. & Tech*. **42**(1-2): 179-186.
6. Lahav O, Artzi E, Tarre S and Green M (2000) Ammonium removal using a novel unsaturated-flow biological filter with passive aeration. *Wat. Res*. **35**(2): 397-404.
7. Lahav O, Morgan BE and Loewenthal RE (2001) Measurement of pH, alkalinity and acidity in ultra-soft waters. *Water SA*, **27**(4), 423-431.
8. Morgan BE, Loewenthal RE and Lahav O. (2001) Rapid Communication. Fundamental study of a one-step Ambient Temperature Ferrite Process for treatment of acid mine drainage waters. *Water SA*, **27**(2) 277-282.
9. Green M., Ruskol Y., Lahav O. and Tarre S. (2001) Chalk as the Carrier for Nitrifying Biofilm in a Fluidized Bed Reactor. *Wat. Res*. **35**(1):284-290.
10. Lahav O, Morgan BE, and Loewenthal RE (2002) Rapid, simple and accurate method for measurement of VFA and carbonate alkalinity in anaerobic reactors. *Env. Sci. & Tech*. **36**(12), 2736-2741.
11. Green M, Denekamp N, Tarre S and Lahav O (2002) Production of gaseous nitrogen in a novel process for ammonium removal. *Wat. Sci. & Tech*. **46**(1-2): 215-222.
12. Morgan BE, Hearne G, Loewenthal RE and Lahav O. (2003) A seeded ambient temperature ferrite process for the treatment of AMD waters: magnetite formation in the presence of high calcium concentration under steady state conditions. *Water SA* **29**(2), 117-124.
13. Lahav O, Morgan BE, Hearne G, and Loewenthal RE (2003) One-step ambient ferrite process for treatment of AMD waters. *Journal of Environmental Engineering* **129**(2), 155-161.
14. Green M., Gidron E., Lahav O. and Tarre S. (2004) Treatment of dairy wastewater using a vertical bed with passive aeration. *Environmental Technology,* **25**(10), 1123-1131.
15. Lahav O., Lu Y., Shavit U., and Loewenthal RE. (2004) Modeling $H_2S_{(g)}$ emission rates in gravity sewage collection systems. *Journal of Environmental Engineering*. **130**(11), 1382-1390.
16. Lahav O., Ritvo G., Slijper I, Hearne G and Cochva M. (2004) The potential of using iron-oxide rich soils for minimizing the detrimental effects of H_2S in aquaculture systems. *Aquaculture.* **238**(1-4), 263-281.
17. Lahav O. and Morgan B. (2004) Appropriate methodologies for monitoring of anaerobic digestion in developing countries - a Review. *Journal of Chemical Technology and Biotechnology*, **79,** 1331-1341.

18. Lahav O, Shlafman E. and Cochva M. (2005) Determination of low citric acid concentrations in a mixture of weak acid/bases. *Water SA,* **31**(4):1-6.
19. Morgan B.E., Lahav O., and Loewenthal R.E. (2005) Advances in seeded ambient temperature ferrite formation for treatment of acid mine drainage. Environmental Science and Technology, 39(19), 7678-7683.
20. Admon S., Tarre S., Sabbah I., Lahav O. and Green M. (2005) Treatment of pre-settled municipal wastewater using a passively aerated vertical bed. *Environmental Engineering Science.* **22**(6), 707-715.
21. Lahav O, Sagiv A and Friedler E. (2006) A different approach for predicting $H_2S_{(g)}$ emission rates in gravity sewers. *Water Research,* **40**(2), 259-266.
22. Lahav O., *Binder A.*, and Friedler E. (2006) A different approach for predicting reaeration rates in gravity sewers and completely mixed tanks. *Water Environment Research,* **78**(7*),* 730-739.
23. Eshchar M., Lahav O, Mozes N., Peduel A. and Ron B. (2006) Intensive Fish Culture at High Ammonium and Low pH. *Aquaculture*, **255**(1-4), 301-313.
24. Friedler E., Lahav O., Jizhaki H., and Lahav T. (2006) Study of urban population attitudes towards various wastewater reuse options: Israel as a case study. *Journal of Environmental Management,* 81: 360-370.
25. Klas S., Mozes N., and Lahav O. (2006) Development of a single-sludge denitrification method for nitrate removal from RAS effluents: lab-scale results vs. model prediction. *Aquaculture,* 259, 342-353.
26. Klas S., Mozes N., and Lahav O. (2006) A conceptual, stoichiometry-based model for single-sludge denitrification in recirculating aquaculture systems. *Aquaculture*, 259, 328-341.
27. Friedler E. and Lahav O. (2006). Centralized Urban Wastewater Reuse: What is the Public Attitude? *Water Science and Technology*, 54(6-7):423-430.
28. Lahav O. and *Birnhack L*. (2007) Quality criteria for desalinated water following post treatment. *Desalination,* 207, 286-303.
29. Molchanov S., Gendel Y., Ioslvich I., and Lahav O. (2007) An improved experimental and computational methodology for determining the kinetic equation and extant kinetic constants of Fe(II) oxidation by *Acidithiobacillus ferrooxidans*. *Applied and Environmental Microbiology*, 73(6), 1742-1752.
30. Alfia Y., Green M., and Lahav O. (2007) Modeling the aeration efficiency of a passively aerated vertical-flow biological filter. *Journal of Environmental Engineering, ASCE*, 133(10), 970-978.
31. Morgan B.E., and Lahav O. (2007) The effect of pH on the kinetics of spontaneous ferrous oxidation by O_2 in aqueous solution – basic principles and a simple heuristic description. *Chemosphere,* 68(11), 2080-2084.
32. Birnhack L. and Lahav O. (2007) A new post treatment process for attaining Ca^{2+}, Mg^{2+}, SO_4^{2-} and alkalinity criteria in desalinated water. *Water Research*, 41(17), 3989-3997.
33. Yermiyahu U., Tal A., Ben-Gal A., Bar-Tal A., Tarchitzky J., and Lahav O. (2007) Rethinking desalinated water quality and agriculture. *Science,* 318, 920-921.
34. Birnhack L., Penn R., and Lahav O. (2008) Quality criteria for desalinated water and introduction of a novel, cost effective and advantageous post treatment process. *Desalination,* 221, 70-83.
35. Firrer D., Friedler E. and Lahav O. (2008) Control of sulfide in sewer systems by dosage of iron salts: comparison between theoretical and experimental results, and practical implications. *Science of the Total Environment,* 392, 145-156.
36. Petrick L., Dubowski Y., Klas S., and Lahav O. (2008) Incorporation of Co^{2+} into ferrite lattice: effects of inflow Fe^{2+}/Co^{2+} ratio, temperature and intermediate solid ferrous species concentration. *Water, Air and Soil Pollution,* 190(1-4), 245-257.

37. Lahav O., Mor T., Heber A.J., Molchanov, S., Ramirez J.C., Li, C. and Broday D. (2008) A new Approach for Minimizing Ammonia Emissions from Poultry Houses. *Water, Air and Soil Pollution*, 191(1-4), 183-197.
38. Seginer I., Mozes N. and Lahav O. (2008) Optimal water refreshment rate in recirculating aquaculture systems. *Aquacultural Engineering*, 38, 171-180.
39. Gendel Y. and Lahav O. Accurate determination of Fe(II) concentrations in the presence of a very high soluble Fe(III) background. (2008) *Applied Geochemistry, 23*, 2123-2129.
40. Lahav O., Salomons E. and Ostfeld A. (2009) Chemical stability of inline blends of desalinated, surface and ground waters: A plea for higher alkalinity values in desalinated water. *Desalination,* 239, 334-345.
41. Lahav O., Bar Massada I., Yackoubov D., Zelikson R., Mozes N., Tal Y. and Tarre S. (2009) Quantification of anammox activity in a denitrification reactor for a recirculating aquaculture system. *Aquaculture*. 288:76-82.
42. Lew B., Cochva M. and Lahav O. (2009) Potential effects of desalinated water quality on the operation stability of wastewater treatment plants. *Science of the Total Environment*, 407, 1404-2410.
43. Birnhack L., Fridman N. and Lahav O. (2009) Potential applications of quarry dolomite for post treatment of desalinated water. *Desalination and Water Treatment,* 1, 58-67.
44. Penn R., Birnhack L., Adin A. and Lahav O. (2009) New desalinated drinking water regulations are met by an innovative post-treatment process for improved public health. *Water Science and Technology - Water Supply* 9(3):225-231.
45. Even-Ezra I., Mizrahi A., Gerrity D., Snyder S., Salveson A. and Lahav O. (2009) Application of a novel plasma-based advanced oxidation process for efficient and cost effective destruction of refractory organics in tertiary effluents and contaminated groundwater. *Desalination and Water Treatment* 11:1–9.
46. Gendel Y., Levi N. and Lahav O. (2009) $H_2S_{(g)}$ removal using a modified, low-pH liquid redox sulfur recovery (LRSR) process with electrochemical regeneration of the Fe catalyst couple. *Environmental Science and Technology*, 43(21):8315-8319.
47. Birnhack L., Penn R., Oren S, Lehman O. and Lahav O. (2010) Pilot scale evaluation of a novel post-treatment process and introduction of a modification based on CO_2-calcite dissolution to attain a wide range of product water qualities. *Desalination and Water Treatment* 13, 128-136.
48. Birnhack L., Oren S., Lehman O. and Lahav O. (2010) Development of an additional step to CO_2-based $CaCO_{3(s)}$ dissolution post treatment processes for cost effective Mg^{2+} supply to desalinated water. *Chemical Engineering Journal*, 160:48-56.
49. Lahav O., Kochva M. and Tarchitzky J. (2010) Potential drawbacks associated with agricultural irrigation with treated wastewaters from desalinated water origin and possible remedies. *Water Science and Technology*, 61(10):2451-2460.
50. Birnhack L. Shlesinger N. and Lahav O. (2010) A cost effective method for improving the quality of inland desalinated brackish water destined for agricultural irrigation. *Desalination,* 262, 152-160.
51. Lew B., Phalah S., Sheindorf H., Kummel M., Rebhun M. and Lahav O. (2010) Favorable operational conditions for obtaining high value struvite-product from filtrate of sludge dewatering systems. *Environmental Engineering Science*, 27(9), 733-741.
52. Gendel Y. and Lahav O. (2010) A new approach to increasing the efficiency of low-pH Fe-electro-coagulation applications. *Journal of hazardous Materials*, 183, 596-601.
53. Birnhack L., Voutchkov N. and Lahav O. (2011). Fundamental chemistry and engineering aspects of post-treatment processes for desalinated water - a review. *Desalination*, 273, 6-22.
54. Klas S., Dubowski Y., Pritosiwi G., Gerth J., Calmano W., and Lahav O. (2011) Extent and mechanism of metal ion incorporation into moderate-temperature precipitated ferrites. *Journal of Colloid and Interface Science*, 358, 129-135.

55. Ostfeld A., Salomons E. and Lahav O. (2011) Chemical Water Stability Inclusion in Optimal Operation of Water Distribution Systems. *J. of Water Resources Planning and Management*.
56. Fridman N. and Lahav O. (2011) Formation and minimization of bromate ions within non-thermal-plasma advanced oxidation. *Desalination*, 280, 273-280.
57. Klas, S., Dubowski Y. and Lahav O. (2011) Chemical stability and extent of isomorphous substitution in ferrites precipitated under ambient temperatures. *Journal of Hazardous Materials*, 193, 59-64.
58. Telzhensky M., Birnhack L, Lehmann O., Windler E. and Lahav O. (2011) Selective separation of seawater Mg^{2+} ions for use in downstream water treatment processes. *Chemical Engineering Journal*, 175, 136-143.

Submitted papers

59. Gendel Y. and Lahav O. Revealing the mechanism of indirect ammonia electrooxidation. *Electrochimica acta*. (Status: revision submitted).
60. Oren S., Birnhack L., Lehmann O. And Lahav O. A different approach for brackish-water desalination, comprising acidification of the feed-water and $CO_{2(aq)}$ reuse for alkalinity, Ca^{2+} and Mg^{2+} supply in the post treatment stage. *Separation and Purification Technology* (Status: Revise).
61. Nir O., Herzberg M., Sweity A., Birnhack L., Lahav O. A novel approach for SWRO desalination plants operation, comprising single pass boron removal and reuse of CO_2 in the post treatment step. *Chemical Engineering Journal*.

Books and chapters in books

62. Lahav, O., Voutchkov N. and Birnhack L. (2011) Post treatment of desalinated water. Publisher: Balaban publishing, European Desalination Society. Status: with publisher.
63. Lahav O., Birnhack L. and Klas S. (2010; 2nd Edition 2011) Aquatic chemistry for process engineers and environmental scientists. 290 pp. (nine-chapter textbook, in Hebrew).
64. Reifen R., Rosen G. and Lahav O. (2008) The intelligence of nutrition, Section 6 within Chapter 13, p. 370-379, "The water we drink". Impress Direct Media, Israel (in Hebrew).

Other publications

65. Tarchitzky J., Cochva, M and Lahav O. (2010) Drawbacks of agricultural irrigation with treated wastewaters from desalinated water origin. Water Engineering, 67: 36-44. (in Hebrew).
66. Ostfeld A., Salomons E., and Lahav O. (2010). "Chemical stability inclusion in optimizing the operation of water networks." Proceedings of the 12th WDSA Conference, Tucson, USA.
67. Lahav O. and Semiat R. Reflecting on water and energy budgets. (2010). Ecology and the Environment, Vol. 1, p. 82-83 (in Hebrew).
68. Lew B., Falah S., Revhun M., Sheindorf C., Kumel M. and Lahav O. (2008). Deliberate struvite precipitation downstream of anaerobic digestion reactors for both phosphorus reuse and minimization of operational problems. Water and Irrigation, 5026: 16-18 (in Hebrew).
69. Birnhack L., Penn R., Fridman N., David Y. and Lahav O. (2007) A novel process for adjusting desalinated water to the new water quality regulations + magnesium. Water and Irrigation, Vol. 496, p. 18-20 (in Hebrew).
70. Birnhack L, Rebhun M, Shaw E., and Lahav O. (2006) Criteria for the quality requested from desalinated water following post treatment – Part 2. Water and Irrigation, Vol. 480, p. 16-21 (in Hebrew).
71. Birnhack L, Rebhun M, Shaw E., and Lahav O. (2006) Criteria for the quality requested from desalinated water following post treatment – Part 1. Water and Irrigation, Vol. 479, p. 20-27 (in Hebrew).

72. Lahav O. (2005) Discussion on "Modeling Hydrogen sulfide emission rates in gravity sewage collection systems". *Journal of Environmental Engineering*, ASCE, **131**(12), 1762-1764.
73. Lahav O. and Loewenthal RE. (2002) Discussion on "Measurement of pH, alkalinity and acidity in ultra-soft waters". *Water SA*, **28**(3), 346 – 348.
74. Loewenthal RE, Morgan BE and Lahav O. (2001) Iron and heavy metals in acid mine drainage waters – equilibrium and treatment considerations. *Water Sewage and Effluent*. **21**(1) 15-23.
75. Lahav O., Ravina I, Lahav A., and Rom D (1996). Urban water reuse: assessment of the public support in the city of Haifa. Water Technologies, Vol. 28, p. 20-28 (in Hebrew).
76. Lahav O. Rom D., Ravina I. (1998) Wastewater reuse in the urban sector: quality and quantity considerations. Water and Irrigation, Vol. 39, p. 32-36 (in Hebrew).
77. Lahav O. and Green M. (1998). Development of a physical-chemical-biological treatment to remove ammonium from wastewater. Water Technologies, Vol. 37, p. 41-44 (in Hebrew).
78. Lahav O, Shlafman E. and Loewenthal R. (2002) Development of an accurate titration method to measure VFA concentrations in anaerobic reactors. Water and Irrigation Engineering. Vol. 22, p. 31-39 (In Hebrew).

Patents

1. Lahav O., Gendel Y., Mozes N., Perlberg A. and Hanin Y. (2010) A cost effective physico-chemical treatment process for removal of nitrogen and phosphorus species from recirculated aquaculture systems (RAS). US provisional patent, November 2010.
2. Addition of Mg^{2+} to desalinated water (re-mineralization) using the reject of nanofiltration (NF) or low salt-rejection reverse osmosis (RO) membranes. PCT int. application No. 61/177,774, May 13, 2010.
3. Lahav, O., Birnhack, L., Kochva, M., Penn, R. (2008). Post treatment for desalinated and soft water for balanced water composition supply. PCT int. application, 29pp. The application is currently tested for registration in app. 20 countries (already approved in several countries).
4. Lahav, Green and Zalel. Swine manure treatment process (2009). PCT international application.
5. Acid Mine Drainage treatment. Patent No.2005/10110 in the name of UCT/WRC, Loewenthal, Morgan and Lahav. Registered in South Africa and Australia.

CONFERENCES

Invited talks (international)

- Desalinated water: quantitative and qualitative issues. 7th world forum of sustainable development. Franco-Israeli views on sustainable development. June 10, 2009, Jerusalem.
- Quality of desalinated water and introduction of a novel process aimed at meeting stringent quality requirements. French Technion Society annual scientific event held at UNESCO, Paris. December 18, 2008.
- Modeling denitrification and anammox activity in a system aimed at complete nitrogen removal from effluents of intensive seawater fishponds. DIARP Workshop, March 5 – 8, 2007, Wageningen University, The Netherlands.
- Denitrification in RAS using intrinsic organic matter and a single reactor concept. In: Securing Product Quality and Production Sustainability in Recirculating Aquaculture (Freshwater and Marine) Systems - Joint workshop between the National Center for Mariculture (NCM), IOLR of Israel and Wageningen University, April 1-3, 2004. The Netherlands.

- Development of a new, simple, accurate and cheap method for monitoring and control of anaerobic reactors treating municipal and industrial waters. Frontiers of Science and Engineering symposium, September 21 – 23, 2003, Istanbul, Turkey. Sponsored by the US National Academies.

Invited talks (national)

- Modeling H_2S emission in gravity sewers – Model development and validation. *2nd Annual Symposium of the Israeli Water Association*. Tel Aviv, Israel, May 2004.
- Removal of nitrate from marine recirculating aquaculture systems: Seabream growth in Eilat as a case study. Resnick annual meeting at the Chemical Engineering Faculty, Technion, April 21, 2005.
- Nitrate Removal from Marine RAS: Process Engineering and Scientific Considerations. The 9th annual Dan Popper Symposium, February 17, 2005, Eilat, Israel
- Removal of nitrate from marine recirculating aquaculture systems using solids hydrolysis and denitrification in a single reactor. Sea Bream culture as a test case. Annual conference of the Israeli Society of Agricultural Engineering. March 3, 2005, Haifa, Israel.
- Post treatment of desalinated water: quality and engineering considerations (2006) *3rd Annual Symposium of the Israeli Water Association*. Beer Sheva, Israel, May 2006.
- Quality criteria for desalinated water and the effect of the introduction of a large volume of desalinated water on Israel's water system. Workshop of the Israeli Union of Water Professionals. Held in Rupin College, December 6, 2006.
- Deliberate struvite precipitation from anaerobic digester supernatants in wastewater treatment plants. Workshop on wastewater treatment technologies organized by the national water company Mekorot. Held in Tel Aviv, September 6, 2007.
- Quality issues associated with desalinated water and agriculture. Shaham conference, March, 2010
- Quality issues associated with large scale desalinated water production and distribution in Israel. Conference on Water and Environmental Issues, Tel Hay College, June 27, 2010.

Contributed talks (no accompanying proceedings)

- Lahav O. A new post treatment process designed for adapting desalinated water to the new Israeli regulations, plus magnesium ions. International session within the annual conference of the Israeli Water Association. Ramat Gan, Israel, March 19, 2008.
- Lahav O. Single sludge denitrification in recirculating aquaculture systems: conceptual model and empirical results. AQUA 2006, May 9 - 13, 2006, Florence, Italy.
- Lahav O. (2002) Rapid, simple and accurate method for measurement of VFA and carbonate alkalinity in anaerobic reactors. Presented at the Annual conference of the Israel Society for Ecology and Environmental Quality, Tel Aviv, December, 17-18, 2002 (In Hebrew).
- Lahav O., Morgan BE, Hearne G. and Loewenthal RE. A one-step ambient temperature ferrite process for treatment of acid mine drainage. 18th Umbrella Symposium. Water Resources Quality Research, 9 – 13 December 2002. Aachen, Germany.
- Lahav O. and Green M. "Ammonium removal from primary and secondary effluents using a bioregenerated ion-exchange process", IAWQ Conference held in Jerusalem (1999).
- Lahav O. and Green M. "Ammonium removal using zeolites and bioregeneration. Specialized INRA conference on nutrient removal, Narbonne (1998).

Refereed papers in international conference proceedings (presenters underlined)

1. Loewenthal RE, Morgan BE and Lahav (2000) "Iron and heavy metals in acid mine drainage waters – equilibrium and treatment considerations". Proceedings of the WISA

Anaerobic Processes Division - Technology Transfer Workshop. August 2000, Johannesburg.

2. Green M., Artzi E., Tarre S., Lahav O. (2000) High rate vertical bed for nitrification. Proceedings of the 7th International Conference on Wetland Systems for Water Pollution Control, Florida, Vol. 1, pp. 269-276.
3. Admon S., Tarre S., Sabbah I., Lahav O. and Green M. (2002). Treatment of pre-settled municipal wastewater using a passively aerated vertical bed. Proceedings of the 8th International Conference on Wetland Systems for Water Pollution Control, Arusha, Tanzania, pp 615-626.
4. Green M., Gidron E., Lahav O. and Tarre S. (2002). Treatment of dairy wastewater using a vertical bed with passive aeration. Proceedings of the 8th International Conference on Wetland Systems for Water Pollution Control. Vol. 1, pp 324-332.
5. Lahav O., Shlafman E, Morgan B., Loewenthal R. and Tarre S. (2002). Accurate on-site Volatile Fatty Acids (VFA) measurement in anaerobic digestion – verification of a new titrative method. VII Latin American Workshop and Symposium on anaerobic digestion. 22-25 October 2002, Merida, Yucatan. pp. 118-125.
6. Lahav O., Yue L., Shavit U., Friedler E., and Loewenthal RE. (2002). A semi-empirical approach for quantifying $H_2S(g)$ emission rates in gravity sewers. International Conference on Sewer Operation and Maintenance - SOM 2002, University of Bradford UK, Nov. 2002. Sponsored by IWA, EPSRC, CIWEM and The Institution of Civil Engineers.
7. Lahav O. and Loewenthal RE. (2003) A different approach towards characterizing very soft terrestrial waters. Asian Water Quality Conference (WATERQUAL), Oct. 19-23, 2003, Bangkok, Thailand.
8. Klas S., Johnson B., Mozes N., and Lahav O. (2004). Removal of nitrate from marine recirculating aquaculture systems using solids hydrolysis and denitrification in a single reactor. Proceeding of the Fifth International Conference on Recirculating Aquaculture, Roanoke, Virginia, USA July 23-24, 2004, pp. 339-349.
9. Eshchar M., Mozes N., Ron B., Peduel A., Lahav O. (2004) Control of toxic metabolites in intensive fish rearing systems - allowing low water exchange without using a nitrification filter. Proceeding of the Aquaculture European Conference, Barcelona, Spain, October 20-23, pp. 324-325.
10. Friedler E and Lahav O. (2005) Centralized Urban Wastewater Reuse: What is the Public Attitude? 10ICUD, 10th International Conference on Urban Drainage. Copenhagen, Denmark, August 2005. Organized by IWA and IAHR. (8 p., on CD).
11. Klas S., Mozes N. and Lahav O. (2006) Development and empirical assessment of a model describing NO_3^- removal from RAS using the activated sludge concept with intrinsic organic matter as the electron donor. Sixth International Conference on Recirculating Aquaculture, Roanoke, Virginia, July 21 - 23, 2006. (10 p., on CD)
12. Birnhack L. and Lahav O. (2006) Development of a cost effective and advantageous post treatment process for desalinated water. First international conference – From Invention and Development to Product held in Sde Boker, Israel, November 28-30, pp. 113-117.
13. Ostfeld A., Lahav O., and Salomons E. (2007). "Desalinated water sources inclusion in optimizing the operation of water systems", Water Management Challenges in Global Change, Ulanicki et al. (Eds.), CCWI2007 and SUWM2007 Conference, De Montfort University, Leicester, United Kingdom, Taylor and Francis Group, London, pp. 387-390.
14. Penn R., Birnhack L., Adin A. and Lahav O. (2008) New Desalinated Drinking Water Regulations are met by an Innovative Post-Treatment Process for Improved Public Health Singapore Water Week Conference, June 23-26, 2008.
15. Birnhack L., Penn R., Oren S., Lehmann O. and Lahav O. (2009) Pilot scale evaluation of a novel post treatment process and introduction of a modification based on CO_2-calcite

dissolution to attain a wide range of product water qualities. Proceedings of "Desalination for the Environment. Clean Water and Energy", 17-20/05/2009, Baden-Baden, Germany.

16. Lew B., Kummel M., Sheindorf C., Phalah S., Rebhun M and Lahav, O. (2009) Determining the operational conditions required for homogenous struvite precipitation from belt press supernatant. International conference on nutrient recovery from waste streams, May 10-13 2009, Vancouver, Canada.
17. Klas S., Dubowski Y., Kirk D.W. and Lahav O (2001) AMD treatment by the ferrite process – opportunities and challenges. Mining & the Environment International Conference, Sudbury, Canada, June 25-27, 2011.
18. Friedler E., Eid K., Alfiya Y., Lahav O., 2011 Quantification and verification of the QUEST method as a tool for rapid assessment of exfiltration from gravity sewers. 12t Int. Conf. on Urban Drainage (ICUD). Organized by IAHR and IWA, Porto Alegre, September 2011 (8 p. on CD).

Participation in organizing conferences

- Member of the program committee of the 3rd annual Israel Water Association conference, June 2006, Beer Sheva.
- Member of the program committee and scientific advisor for the program of the 4th annual Israel Water Association conference, March 2007 in Ramat Gan.

Honors

❖ 2007 Hershel Rich Technion Innovation Award for the work "Development of a cost effective and advantageous post treatment process for desalinated water".

❖ 2007 Patent No.2005/10110, Acid Mine Drainage treatment was the recipient of the Innovation Fund Patent Incentive Fund award of the South African Government.

❖ 2010 Recipient of the France-Israel Foundation Award for Academic Excellence in the field of Water.

Chairperson at scientific conferences

1. Asian Water Quality Conference (WATERQUAL), Oct. 19-23, 2003, Bangkok, Thailand. Chaired Session C - "Drinking Water Quality Treatment and Distribution".
2. Annual conference of the Israel Society for Ecology and Environmental Quality, Tel Aviv, June 2004. "Wastewater Treatment" session.
3. Annual conference of the Israel Society for Ecology and Environmental Quality, Haifa, June 2006. "Water Reuse" session.

Software

- Lahav O., Morgan B.E. and Loewenthal R.E. (2002) 8-point Titration Method for Measurement of Carbonate Alkalinity and VFA in Anaerobic Reactors. A user-friendly computer program for control of anaerobic digestion plants.