CURRICULUM VITAE

May, 2026

1. Personal Details: Giora Rytwo

Date of birth: 14/7/1958

Country of birth: Argentina

Identity No.: 013295258

Nationality: Israeli

Family status: Married

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2. Higher Education

1982-1985 B.Sc.Agr. Cum Laude, The Hebrew University of Jerusalem, Faculty of Agriculture, Dept. of Soil and Water Sciences.

1986-1989 M.Sc.Agr. Cum Laude, The Hebrew University of Jerusalem, Faculty of Agriculture, Dept. of Soil and Water Sciences; specialization in micrometeorology.

1989-1994 Ph.D. thesis on "Interactions between organic cations and montmorillonite: adsorption and model calculations". The Hebrew University of Jerusalem (Instructors: Prof. Shlomo Nir and Prof. Leon Margulies).

3. Additional Education, Training and professional certificates

1994-1996 Part time post-doctoral fellowship at The Hebrew University of Jerusalem, Faculty of Agriculture, Dept. of Soil and Water Sciences and MIGAL- Galilee Technological Center

1996 Post-doctoral fellowship at The Appalachian Soil & Water Conservation Research Laboratory of the United States Department of Agriculture (four months and extended collaboration).

1997/8 Post-doctoral fellowship at Centre de Recherche sur la Matière Divisée, CNRS and Université d'Orléans, France (five months during two summers).

4. Appointments at academic institutions

1994 Guest lecturer. Tel Hai College.

1996-2001 Staff member, instructor and lecturer. Tel Hai College.

2001-2005 Senior Lecturer, Tel Hai College.

2005-2012 Associate Professor, Tel Hai College.

2009-2012 Head of ""The Cherie and Aaron Raznick Chair for the Study of Sustainable Relations Between People and the Environment in the Upper Galilee."

2012- Full Professor, Tel Hai College.

2016- 2018 Delivered a course in "Environmental Remediation" at IMACS- International Master Degree in Clay Sciences, University of Poitiers, France (in 2016 in Poitiers, in 2017-2018 as remote learning).

2023 Delivered a "Water quality physico-chemical parameters" module in an M.Sc. and Ph.D students E-course in "Reduction and assessment of antimicrobial resistance and emerging pollutants in water and wastewater treatment systems" as part of The REWA project, AquaticPollutants ERA-NET Cofund (GA No 869178), University of Oulu, Finland.

5. Administrative positions in academic institutions

2001-2006 Head, Environmental Sciences Program, Department of Biotechnology and Environmental Sciences, School of Sciences, Tel Hai College.

2003-2006 Dean, Faculty of Sciences and Technology, Tel Hai College.

2006-2008 Head, Department of Environmental Sciences, Faculty of Sciences and Technology, Tel Hai College.

2012-2016 Member at the "Biotechnology, Biology, Environmental Sciences and similar disciplines Sectional Committee" at the Israeli Council for Higher Education

2016-2020 Head, Department of Environmental Sciences, Faculty of Sciences and Technology, Tel Hai College.

2019-2020 Head, Research Authority- Tel Hai College.

6. Positions in non academic & research Institutions

- 2000-2005 Secretary, Israeli Society of Clay Research.
- 2007-2009 Research and Development manager of "ToxSorb", an industrial enterprise founded by "MIGAL- Gavish" and "Water Sinergies LLC", aiming water treatment and purification.
- 2004-2025: Head, Environmental Physical Chemistry Laboratory, MIGAL –Galilee Technological Center (retired on 2025).
- 2009-2011: The Cherie & Aaron Raznick Chair for The Study of a Sustainable Man-Environment Relationship in Upper Galilee.
- 2009-2013: Chair, Teaching Clay Minerals Committee, and Council Member, International Association for the Study of Clays, AIPEA, http://www.aipea.org/council.html
- 2009-2017: Editorial Board, Open Colloid Sci. J. http://www.bentham.org/open/tocollsj/EBM.htm
- 2010-2017- Editorial Board, Recent Patents in Nanotech. J. http://www.bentham.org/nanotec/EBM.htm
- 2010-2017: Directive Board, Spanish Association for Clay Research (SEA).
- 2012: Guest Editor, Special Issue on "Clays for Water Purification and Treatment", *Applied Clay Sciences,* Elsevier.
- 2011- 2016 Editorial Board, Applied Clay Sciences, Elsevier
- 2012: Symposium Organizer for the “Chemistry in Water Treatment and Purification Symposium”, including three sessions with 30 lectures and 15 posters, to be held at the 243rd American Chemical Society National Meeting & Exposition, in San Diego, California, March 25 – 29, 2012

- 2012- Co-Founder, advisor and lecturer in "Academy in Town Square" - a community oriented project delivering academic-level courses accessible to the general public in Kiryat Shmona and environs (media links #1, #2, #3).
- 2013: Chair and Sessions Organizer, Water-Related Medical Geology Issues Symposium Organizer, MEDGEO 2013, 5th International Conference in Medical Geology, Arlington, VA Aug. 25-29, 2013.
- 2013-2018 Participation in HINT- COST European Action (http://www.cost-hint.cnrs.fr/)
- 2015-2019 Member of the editorial board of Clay Minerals representing the Israel Society for Clay Research
- 2016-2019 Head, Israeli Society of Clay Research
- 2017: Symposium Organizer for the "Clays, organoclays and nanocomposites in Water Treatment" session, XVI International Clay Conference, Granada, Spain, July 2017
- 2017- 2018 European Network for Israel delegate in the Management Committee to COST Action CA16229, European Network for Environmental Citizenship Environmental Citizenship
- 2017-2019 Member of the Water Standardization Committee at The Standards Institution of Israel.
- 2020 Symposium Organizer for the "Clays in the Environment", 4th Asian Clay Meeting (online), Thailand, July 2020.
- 2020 Guest Editor, Special Issue on "Clays and the Environment", *Clays and Clay Minerals*.
- 2022-2024 Participation in COST PRIORITY "Plastics monitoRIng detectiOn RemedIaTion recoverY"
- 2026 Session Organizer for the Clay Minerals Society 2026 Meeting, Session 6, "The use of clays, organoclays and nanocomposites for water treatment", Provo, UT, 7-11 July 2026.

7. Membership in professional organizations

1991- today Israeli Clay Society

1998-2005 Soil Science Society of America

2009- 2014, Invited member- Spanish Association for Clay Research (SEA).

1998-today Clay Mineral Society

2001- today AIPEA Association Internationale pour L'etude des Argiles

2007- today, American Chemical Society

8. Research Grants

1. 1999-2002: A grant for Strategic Research by the Ministry of Science, Israel, in minimizing the ecological hazards of pesticides. The grant is a multidisciplinary four groups cooperation, for a total budget of 3 million NIS over three years of research. The group which I was its principal investigators received 400000 NIS to study the addition of monovalent organic cations to contact herbicides and the behavior of environmentally oriented pre-germinence pesticides in Hulah Valley soils.
2. 2001-2004: Collaborating Investigator in BARD project IS-3120-99R, entitled "The role of binding to the root surface and electrostatic attraction in the uptake of heavy metal plants". The P.I. was Dr. Uri Yermiyahu (ARO, Israel).

3. 2001-2003: A grant from the Niedersächsisches Ministerium für Wissenschaft und Kultur on "Characterization and optimization of the anion sorption capability of organophilic clays". This study is a joint proposal with Prof. Shlomo Nir and Dr. Stefan Dultz, aimed on the development of organo-clays suitable for utilization in clay barriers, with maximum sorption capacity for anions and chemical stability (a total of 200000 DM).
4. 2002: A grant for the "Promotion of Higher Education in the Eastern Galilee" by the Jewish Agency for Israel and the UIA Federations Canada, on "Use of Langmuir Bludgett technique for the preparation of herbicides formulations" (12000 NIS).
5. 2005-2009: A personal grant from the Israel Science Foundation, on "Herbicide/ clay- organic complexes prepared in a mixed hydrophobic/ hydrophilic phase to reduce ecological hazard" (a total of about 200000$).
6. 2007-2009: A grant for Infrastructure Research by the Ministry of Science, Israel, entitled Novel Tailored Water Treatment Solutions Based on Clay Nano-Technologies. The grant is a six groups cooperation, for a total budget of 1.5 million NIS over three years of research. The group which I was its principal investigators received 160000 NIS to study the use of CV-, TPP- and other organoclays, for water purification
7. 2007-2009: Ministry of Science Regional Research fund with Prof. Pitkovsky and Prof. Vaya
8. 2010-2011: A grant from J.C.A for the Establishment of a Center of Excellence in Environmental & Water Sciences in MIGAL ($120000), preseted with Prof. M. Iggy Litaor.
9. 2010-2013: A grant from the Ministries of Agriculture and Environmental Protection, on "Adaptation and test of a Gouy-Chapman-Stern adsorption model as a tool for the evaluation of wastewater pharmaceuticals behavior in soils". (A total of 270000 NIS during three years)
10. 2011-2014: European ECO-INNOVATION 2010 Project on **Mobile Integrated Sustainable System for Treatment of Organic Wastewater (MISSTOW),** a joint project with industry and research institutes from Israel, Spain and Greece. The project has a budget of 1.8 million Euro, and for MIGAL/Tel Hai 300000 Euro for three years for research and additional 800000 Euro allocated to "Peleg Hagalil" company as coordinator, for the preparation of the pilot device.
11. 2011-2012: Support by the Italian Government for a Research Visit at the Dipartimento di Chimica "Stanislao Cannizzaro" of the Universita' degli Studi di Palermo
12. 2012-2014: A "Kamin" grant from the Ministry of Commerce and Industry on the development of platforms for the removal of organic pollutants via adsorption and photodegradation (A total of app. 800000 NIS during two years).
13. 2012-2013: Tel Hai College Grant for Interdisciplinary Research: 50000 NIS with Dr. Gonen Sharon to study the application of ATR-FTIR on wood ancient samples.
14. 2013: Tel Hai College Internal Grant for Environmental Research: 25000$ NIS to study the use of clay-polymer nanocomposites on dairy effluents
15. 2014: A pilot device on the treatment of cowshed effluents by coagoflocculation process- supported by the Israeli Ministry of Agriculture (20000$)
16. 2015-2016: A "Kamin" grant from the Ministry of Economics on the application of clay and biocomposites for the reduction of the "Metabolic Syndrom" together with Dr. Roee Guttman (800000 NIS during two years).
17. 2017: MIGAL internal competitive grant: "Application of clay polymer nanocomposites in potable water

treatment", 65000 NIS during 8 months.

18. 2017: MIGAL internal competitive grant: "Ambient temperature moderation by combining monitoring of heat flux with changes in heat transfer properties of the walls", 80000 NIS during 8 months.
19. 2018-2020: A grant from the Ministry of Agriculture, on "Clay mineral based formulations for slow release of essential oils, aiming thrips control", together with Dr. Shaaltiel, Prof. Dudai & Dr. Ben Yakir. (A total of 740000 NIS during three years, app. 40% to Prof. Rytwo's research group).
20. 2020: Tel Hai College Internal Competitive Grant on COVID19: Hybrid matrices for adsorption and deactivation of pathogens in masks and air filters, 20000 NIS for preliminary results gathering.
21. 2021-2024: AquaticPollutants Joint Transnational Call 2020- ERA-NET European proposal with the Israeli Ministry of Health "REWA- Reduction and assessment of antimicrobial resistance and emerging pollutants in natural-based water and wastewater treatment systems". 140000 € for three years to our research group.
22. 2021-2022: Tel Hai College-Shamir Internal Competitive Grant: Evaluation of different heterogeneous photocatalyst for oxidation of carbamazepine (With Dr. Sara Azerrad), 20000 NIS for preliminary results gathering.
23. 2021-2022: Tel Hai College Competitive Grant on Sustainability: Influence of environmental events on air quality parameters in the Northern Hulah Valley (With Dr.Oren Reichman and Dr. Yossi Arel), 40000 NIS.
24. 2022-2023: Tel Hai College Annual Competitive Grant: Developing an Azoxystrobin slow-release clay carrier for eco-friendly control of corn late wilt and cotton charcoal rot diseases (With Dr. Ofir Degani), 20000 NIS.
25. 2022-2023: Israel Innovation Authority Grant, in cooperation with Mekorot (Israeli Water Company): Photochemical oxidation technology for decomposition of residual pollutants in effluents. 550000 NIS for one year.
26. 2023: MIGAL Annual Competitive Grant: Developing an Azoxystrobin slow-release clay carrier for eco-friendly control of corn late wilt and cotton charcoal rot diseases (With Dr. Ofir Degani), 100000 NIS.
27. 2023-2024 ICA Annual Competitive Grant: Developing an Azoxystrobin slow-release clay carrier for eco-friendly control of corn late wilt and cotton charcoal rot diseases (With Dr. Ofir Degani), 50000 US$.

8.2 Additional Funding (Industrial Sources)

1. 2007-2009- Support on the study of modified activated carbon for the efficient removal of inorganic pollutants from water and effluent. The support was granted by "*TOXSORB"* a startup company, and included funding of chemicals, technician salary, maintenance of analytical equipment, payments for patents and publications, and cost of analytical measurements as outsourcing. The total financial support during the whole 2 years period is evaluated as 200000$.

2. 2010- Industrial research for CAMTEK company on ink-jet ink for integrated circuits- approximately $20000

3. 2012- Industrial research for Shamir Optics Company on dyes fading of lenses- approximately $2000

4. 2012-3 Industrial research for ION-MED Company on the influence of γ irradiation on medical biopolymer welding incision patches- approximately $10000

5. 2013: Industrial research for ENVERID Co- adsorption of CO_2 in air conditioning systems- app. 20000$.

6. 2013-2016: ICL- Innovation agreement with MIGAL and Prof. Rytwo. 200000$ were allocated for preliminary feasibility study, and additional funds were applied for the manufacturing and commercializing (under license) of

nanocomposites for wastewater clarification under the brand “NC”.

7: 2018-2019 Technical support to Dekko-SafePack on the manufacturing of clay polymers nancocomposites for water clarification (under license)

8: 2020- Technical support to GES- Global Environmental Solutions LTD. on the manufacturing of clay polymers nancocomposites for water clarification (under license).

9. Teaching at Academic institutions

1987-1994: Assistant Teacher in the following courses in the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot: Physics (1987-1993); Fundamental Meteorology (1991); Hydrology (1987); Physical Methods of Chemical Analysis (1990,1992); Clay-Organic Interactions (1990,1994); and Agrometeorology (1991) (the last three are graduate courses).

1990- Lecturer in a course of Agrometeorology, organized by the Division for International Cooperation of the Ministry of Foreign Affairs, Nairobi, Kenya, 1990.

1997-1998 co-lecturer in the graduates course Clay Organic Interactions, in the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot.

1999-2000 co-lecturer in the graduates course Physical Methods of Chemical Analysis, in the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot.

Since 1994 until now, lecturer and instructor of the following courses in the Tel Hai College:

- Physics (under the Faculty of Agriculture of the Hebrew University) 1994-2001
- Fundamental Chemistry (under the Faculty of Agriculture) 1994-1996
- Meteorology 1995- 2000
- Environmental Aspects of Soil and Water Sciences 1995- 2000
- Physics for Food Sciences 2002-2007
- Thermodynamics for Nutrition Sciences 2005-2012
- Technical Thermodynamics- 2009-2012
- Chapters in Modern Physics 1994-2014, reinitiated in 2022.
- Physical Chemistry and Thermodynamics 1995-now.
- Analytical and Instrumental Chemistry 1996-2019
- Aquatic Environmental Chemistry 2000-2017
- Introduction to Meteorology and Climatology 2002-2017.
- Chapters in Advanced Physical Chemistry (Graduate Students Course) 2009-now (every two years).
- Physicochemical methods in Water Treatment (Graduate Students Course) 2017-now (every two years).
- Methods of Analytical Spectroscopy (Graduate Students Course and planned to be suggested as a yearly International Workshop) 2020

International Courses:

- February-March 2016, 2017 and 2018: An M.Sc. course in "Environmental Remediation" at IMACS- International Master Degree in Clay Sciences, University of Poitiers, France (during 2017/8 delivered by remote learning).

- "Water quality physico-chemical parameters" module in an M.Sc. and Ph.D students E-course in "Reduction and assessment of antimicrobial resistance and emerging pollutants in water and wastewater treatment systems" as part of The REWA project, AquaticPollutants ERA-NET Cofund (GA No 869178), University of Oulu, Finland.
- Deliveried lectures and laboratory experiments in a Membrane Technologies M.Sc. Course at the Warsaw University of Life Sciences (SGGW) as part of the European Erasmus Mobility Project (May 2025)

Courses at "Academy in Town Square" Project:

- The Amazing Modern Physics' Revolution (Winter 2012 and 2015, 2021)
- Prepare your own weather forecast: About meteorology internet resources (2013, 2016 & 2020).
- Water monitoring: Parameters for Environmental Understanding of Water Pollution (2014, 2022-3)
- Everyday thermodynamics: Understanding engines, refrigerators and other machines (2017. 2019, 2023)
- Alternative Energy Sources (2024-2025)

10. Supervision of Master's and Ph.D. degree students

1. 1997-1999, Co-supervisor in the M.Sc. thesis of Mrs. Yael Mishael, on Adsorption of Organic Cations to Pillared Clays. M.Sc. thesis in the Seagram Center for Soil & Water Sciences, the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot.
2. 2000-2003, Co-supervisor in the M.Sc. thesis of Mr. Mordechai Tavasi, on Utilizing Clay-Organic Interactions In Order To Increase The Efficacy Of Herbicides. M.Sc. thesis in the Seagram Center for Soil & Water Sciences, the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot.
3. 2003-2005, Co-supervisor in the M.Sc. thesis of Mr. Yotam Gonen, on Clay-Organic Complexes as Barriers for Anionic Pollutants, the Environmental Studies Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot.
4. 2004-2009, co-supervisor in the M.Sc. thesis of Mrs. Reuma Huterer-Shweqi, on Removal of Organic Pollutants from Water by means of Organo-Vermiculite Complexes, the Environmental Studies Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot.
5. 2005-2011 Co-supervisor, Ph.D. thesis of Mr. Yotam Gonen, on Filtration techniques for Phenol- and Benzene-derivatives, based on Clay-Organic Complexes, the Environmental Studies Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot (with Prof. S. Nir).
6. 2004-2008, Co-supervisor in the M.Sc. thesis of Mr. Shmulik Afuta, on The use of organoclays as platforms for environmentally oriented herbicide formulations, the Environmental Studies Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot (with Prof. S. Nir).
7. 2005-2008 Co-supervisor in the M.Sc. thesis of Mrs. Ronit Ganigar, on Protein- organoclay interactions, the Environmental Studies Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot (with Dr. Yael Mishael).

8. 2006- Co-supervisor in the M.Sc. studies (without thesis) of Mr. Roee Arad, the Environmental Studies Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot (with Dr. Yael Mishael).
9. 2007-2010 Co-supervisor in the M.Sc. thesis of Mr. Nir Bluvshtein, on "Examining the influence of two anthropogenic factors, agricultural & industrial, on the north Hulla valley air quality", the Soil and Water Sciences Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot (with Prof. Y. Mahrer).
10. 2007-2011 Co-supervisor in the M.Sc. thesis of Ms. Hilla Varman, on Herbicide formulations for the reduced photodegradation of pendimethalin, the Soil and Water Sciences Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot (with Dr. Y. Mishael).
11. 2008-2012 Co-supervisor in the M.Sc. thesis of Mr. Assaf Mendelovits, on Herbicide formulations based on biopolymers-clay, the Soil and Water Sciences Department of the Faculty of Agriculture of the Hebrew University of Jerusalem, in Rehovot (with Dr. Y. Mishael).
12. 2008-2011 Supervisor in the M.Sc. thesis of Mr. Tom König, on Removal of Humic Substances from Saline Effluents and Sea Water, Department of Biotechnology, Tel Hai College.
13. 2011-2014 Supervisor in the M.Sc. thesis of Ms. Tami Prat, on Adsorption of caffeine on clays. Department of Biotechnology, Tel Hai College.
14. 2012-2015 Supervisor in the M.Sc. thesis of Ms. Sivan Margalit, on Adaptation and test of a Gouy-Chapman-Stern adsorption model as a tool for the evaluation of wastewater pharmaceuticals behaviour in soils, Tel Hai College.
15. 2011-2014 Co-Supervisor in the Ph.D. Thesis of Mr. Gur Mizrahi, on Influences of Desalination Concentrated Effluents on Oceanographic Physicochemical and Biological Parameters, the Marine Biology Department of the University of Haifa (with Dr. D. Tchernov).
16. 2012- Co-Supervisor in the Ph.D. Thesis of Mr. Tom König, on Examination of the parameters affecting the pretreatment of winery and olive mill wastewaters using nanocomposites based on clay minerals and polymers, the Faculty of Civil and Environmental Engineering Technion - Israel Institute of Technology Haifa (with Prof. C. Dosoretz) (cancelled by the student due to personal reasons).
17. 2016: Supervisor in the Post-Doc project of Dr. Yaniv Olshansky, in the framework of CEREHA EU project.
18. 2015-2017 Supervisor in the M.Sc. thesis of Ms. Karin Nirnberg, on Application of Nanocomposites for the Removal of Suspended Solids in Dairy Effluents. Department of Biotechnology, Tel Hai College.
19. 2016-2021 Supervisor in the M.Sc. thesis of Mr. Eyal Bitkover, on UV-Vis Instruments for On-Line Monitoring of Pollutants, together with Dr. Meir Merom from "Mekorot" Israel National Water Company. Department of Water Sciences, Tel Hai College.
20. 2016-2020 Supervisor in the M.Sc. thesis of Mr. Chen Barak, on Streaming Current Detector as Method for Dose Determination in Coagulation and Flocculation Processes. Department of Water Sciences, Tel Hai College.
21. 2016-2018 Member of Research Committee for the M.Sc. study of Samya Abdelhadi-Saadi, on "Production of biochar from olive mill solid waste for removal of heavy metals and polycyclic aromatic hydrocarbons from

industrial wastewater" under the supervision of Prof. Hassan Azeizeh and Prof. Carlos Dosoretz. The Faculty of Civil and Environmental Engineering, Technion

22. 2017 Supervisor on Noel Frank Aymon N'Guessan in a 5 months M.Sc. Internship, focusing on Preparation of Nanocomposites for Specific Adsorption of Phosphorus in Effluents, IMACS program, University of Poitiers.
23. 2017-2019 Supervisor in the M.Sc. thesis of Mr. Elad Israel, on Photocatalytic degradation of Personal Care and Pharmaceutical Products (PCPP's). Department of Water Sciences, Tel Hai College (suspended due to personal reasons).
24. 2018-2019 Supervisor in the Post-Doc project of Dr. Pedro-Peter Rendel, on photodegradation of PCPPs.
25. 2018-2020 Co-Supervisor (with Dr. Roee Gutman) in the M.Sc. thesis of Mrs. Keren Levy, on "Chitosan-Sepiolite Biocomposites for the Mitigation of Metabolic Syndrom". Dept. of Biotechnology, Tel Hai College.
26. 2018- Member of Research Committee for the Ph.D. study of Lior Levy, on "Promoting Heterogeneous Fenton Oxidation of Pollutants Using Iron-Bearing-Gallic Acid Clay Composites" under the supervision of Dr. Adi Radian. The Faculty of Civil and Environmental Engineering, Technion
27. 2018-2021 Supervisor in the M.Sc. thesis of Mr. Shem Levy, on "Photochemical degradation of BPA and BPS". Dept. of Water Sciences and "Sion Project", Tel Hai College.
28. 2019-2022 Co-Supervisor (with Dr. Liora Shaaltiel Harpaz) in the M.Sc. thesis of Mr. Tamir Kramer, on "Clay based formulations for essential oil pesticides ". Dept. of Water Sciences, Tel Hai College.
29. 2019-2023 Co-Supervisor (with Prof.Assaf Sukenik) in the M.Sc. (without thesis) of Mrs. Adi Rosenstein, on "Clay based materials and nanocomposites for the removal Cyanbacteria and its toxins". Dept. of Water Sciences, Tel Hai College.
30. 2019-2022 Co-Supervisor (with Dr. Meir Shlisel) in the M.Sc. thesis of Mrs. Yael Butnaru, on "The effect of leaf removal in vineyard on the chemical composition of grapes and wine in Cabernet Sauvignon and Syrah. Calibration of FTIR spectroscopy method in order to evaluate quality indices in grapes". Dept. of Biotechnology, Tel Hai College.
31. 2020-2022 Co-Supervisor (with Dr. Sara Azerrad) in the M.Sc. thesis of Mr. Yuval Shachar, on "Removal of contaminants of concern by from water by photocatalysis". Dept. of Water Sciences, Tel Hai College.
32. 2022-2025 Supervisor in the M.Sc. thesis of Mrs. Dafna Eliyahou, on "Eddy covariance measurements of sensible and latent heat fluxes on an orchard with photovoltaic coverage". Dept. of Water Sciences, Tel Hai College.
33. 2022-2025 Supervisor in the M.Sc. thesis of Mr. Yehezkel Zwecher, on "Clarification of water from reservoirs". Dept. of Water Sciences, Tel Hai College.
34. 2022-2025 Supervisor in the M.Sc. thesis of Mr. Dor Horovitz, on "Reuse of washing processes water". Dept. of Water Sciences, Tel Hai College.
35. 2021-2023 Supervisor in the Post-Doc project of Dr. Ilil Levakov, on adsorption matrices for contaminants of concern (CECs).
36. 2022-2023 Supervisor in the Post-Doc project of Dr. Lior Levy, on photodegradation of CECs.
37. 2023-2025 Co-Supervisor (with Prof. Adi Radian, Technion) in the M.Sc. thesis of Mr. Tamir Zalmon, on

"Adsorption of PFAS/PFOS from water by organiclays". Technion.

11. List of Publications

11.1 Dissertations

Rytwo, G. (1989) Evaluation of irrigation water amounts in cotton by means of the Eddy Correlation Technique, and comparison to field other Micrometeorological methods. M.Sc. Thesis (in Hebrew, English summary, under supervision of Prof. Yitzhak Mahrer, Hebrew University of Jerusalem).

Rytwo, G. (1994) Interactions between organic cations and montmorillonite, adsorption and model calculations. Ph.D. Thesis, Hebrew University of Jerusalem (in Hebrew, English summary). Under the supervision of Prof. Shlomo Nir and Prof. Leon Margulies

11.2 Books (Academic)

11.3 Books Edited

11.4 Chapter in Collections (editing books)

1 **Rytwo, G.**; S. Nir; M. Crespin, L. Margulies. (1998) Adsorption and interactions of methyl green with montmorillonite and sepiolite. Proceedings of the 2nd Mediterranean Clay Meeting, Aveiro, Portugal, 1998 **2:** 220-226.

2 **Rytwo, G.** (2000) The use of clay-organic interactions to improve efficacy of contact herbicides: addition of monovalent organocations to divalent herbicides. Proceedings of the 1st Latin-American Clay Conference "Clays in Volcanic Environments", Funchal, Madeira **1:** 332-344.

3 Nir, S.; **Rytwo, G.**; Undabeytia, T. and Pulobesova, T. (2002) Adsorption of organic cations to clays: Experimental results and modeling *in*: Organo-clay complexes and interactions. S. Yariv and H. Cross (eds), Marcel Dekker Publ. 193-222.

4 **Rytwo, G.** (2003) Three simple experiments to demonstrate the impact of clay minerals on the behavior of organic pollutants in soils *in:* "2001. A clay odyssey", Proceedings of the 12th International Clay Conference, Bahia Blanca, Argentina, July 22-28, 2001. E. Dominguez, G.R, Mas and F. Cravero (eds), Elsevier Science B.V. 561-568.

5 Vulkan R., Yermiyahu, U., Kinraide T.B., Mingelgrin U., **Rytwo G.** (2003) Binding and electrostatic attraction of copper and zinc to plasma membrane of wheat root. 7th International Conference on the Biogeochemistry of Trace Elements. Uppsala, Sweden. 15-19, 2003. (eds. G.R. Gobran and N. Lepp), **2**: 142-142.

6 **Rytwo, G.** (2004) A worksheet adsorption/desorption model on clays, *in* Clay Surfaces: Fundamentals and Applications, Wypych F. and Satyanarayana, K.G. (Eds.) in the Series: "Interface Science and Technology book series", Series Editor: A Hubbard, Elsevier Academic Press, Amsterdam, The Netherlands, p. 153-183. https://doi.org/10.1016/S1573-4285(04)80040-1

7 Undabeytia, T.; Nir, S.; **Rytwo, G.**; Serban, C.; Morillo, E.; Maqueda, C. (2005) Modeling adsorption-desorption processes of Cu on montmorillonite and the effect of competitive adsorption with a cationic pesticide, in Reactive Transport in Soil and Groundwater, Nützmann, G.; P. Viotti and P. Aagaard (Eds.) Springer-Verlag Press , Berlin, Germany, p. 79-92. http://dx.doi.org/10.1007/3-540-26746-8_6

8 Dultz, S. and **Rytwo, G.** (2005) Effects of different organic cations on the electrokinetic surface charge from organo-

montmorillonites - consequences for the adsorption properties. "Clays of Geotechnical and Economical Interest." Swiss, Austrian and German Clay Group –DTTG Annual Meeting. Celle, Germany, October 5th-8th, 2005, DTTG Reports 11, 6-14.

9 Nir, S.; El-Nahhal, Y.; Undabeytia, T.; **Rytwo, G.**; Polubesova, T.; Mishael, Y.; Rabinovitz, O.; and Rubin, B. Clays and pesticides (2006). Handbook of Clay Science. F. Bergaya, B.K.G. Theng, and G. Lagaly (Editors) pp. 685-699. https://doi.org/10.1016/B978-0-08-098259-5.00022-6

10 Shuali, U., S. Nir and **G. Rytwo.** 2011. Chapter 15: Adsorption of surfactants, dyes and cationic herbicides on sepiolite and palygorskite: Modifications, applications and modelling. p. 351-374. *In* Emilio Galàn and Arieh Singer (ed.) Developments in clay science, Vol. 3. Elsevier Academic Press, Amsterdam, The Netherlands. http://dx.doi.org/10.1016/B978-0-444-53607-5.00015-3

11 Nir, S.; El-Nahhal, Y.; Undabeytia, T.; **Rytwo, G.**; Polubesova, T.; Mishael, Y.; Rabinovitz, O.; and Rubin, B. Chapter 5.2: Clays, clay minerals and pesticides (2013). *In* F. Bergaya and G. Lagaly (Editors) Developments in clay science, Vol 5B. Elsevier Academic Press, Amsterdam, The Netherlands. http://dx.doi.org/10.1016/B978-0-08-098259-5.00022-6

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91. Rytwo, G.; Tsveher, Y.; Viner-Mozzini, Y.; Sukenik, A. 2026. Application of Clay–Polymer Nanocomposites for the

Removal of Toxic Cyanobacteria and Other Phytoplankton from Water—A Laboratory Scale Study. *Water 2026, Vol. 18, Page 1301* 2026, *18*, 1301, doi:10.3390/W18111301. (IF: 3.0 Citescore 6.0, Q1 in Aquatic Science and Water Science and Technology)

11.6 Articles Submitted

11.7.1 **Granted Patents**

1. **Rytwo, G.** (2017) US954610B2, 13/967644 based on WO2012176190 No. PCT/IL2012/000245 on "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites", granted 17/1/2017
2. **Rytwo, G.** (2017) IL230108 based on WO2012176190 No. PCT/IL2012/000245 on "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites", granted 24/12/2017
3. **Rytwo, G.** (2019) AU2014307558 based on WIPO WO2015022695 PCT/IL2014/050738, "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites and Bridging Polymers", granted 21/3/2019
4. **Rytwo, G.** (2019) US10273169 based on WIPO WO2015022695 PCT/IL2014/050738, "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites and Bridging Polymers", granted 30/4/2019
5. **Rytwo, G.** (2020) IL244020 based on WIPO WO2015022695 PCT/IL2014/050738, "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites and Bridging Polymers", granted 1/5/2020
6. **Rytwo, G.,** Daskal, G. (2020) EP15842324.4 **EP3194342** based on PCT/IL2015/050944, WO2016042558A1 priority based on UK Application No.1416495.8, "A system for treatment of polluted effluents" granted 4/11/2020.
7. **Rytwo, G.** (2021) 12802734.9, **EP 2723690 B1** based on WO2012176190 No. PCT/IL2012/000245 on "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites", granted 24/2/2021
8. **Rytwo, G.** (2021) 14836529.9 EP3033305 based on WIPO WO2015022695 PCT/IL2014/050738, "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites and Bridging Polymers", granted 24/3/2021
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10. **Rytwo, G.,** Daskal, G. (2021) US15/512,516 based on PCT/IL2015/050944, WO2016042558A1 priority based on UK Application No.1416495.8, "A system for treatment of polluted effluents" granted 15/6/2021.
11. **Rytwo, G.** (2021) IN201847034847, 369352 based on PCT/IL2016/050700 WO/2017/158581 "Methods for Production of Potable Water" granted 18/6/2021
12. **Rytwo, G.** (2021) US20190152813 Appl. No 16/085,085, based on PCT/IL2016/050700 WO/2017/158581 "Methods for Production of Potable Water", allowed 2/8/2021, granted 7/12/2021
13. **Rytwo, G.** (2021) NZ 717972 based on WIPO WO2015022695 PCT/IL2014/050738, "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites and Bridging Polymers", granted 4//11/2021
14. **Rytwo, G.,** Daskal, G. (2021) IL284089 based on PCT/IL2015/050944, WO2016042558A1 priority based on UK Application No.1416495.8, "A System for Treatment of Polluted Effluents by Photocatalysis" granted 1/2/2022.

15. **Rytwo, G.** (2022) CA 2927610 based on WIPO WO2015022695 PCT/IL2014/050738, "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites and Bridging Polymers", granted 5/7/2022
16. **Rytwo, G.** (2022) BR 11 2018 068812 6 based on PCT/IL2016/050700 WO/2017/158581 "Methods for Production of Potable Water" granted 5/4/2022
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17.7.2 **Other patent applications (Provisional and PCT)**

18. **Rytwo, G.** and Y. Gonen (2009) WIPO Pub. No. WO/2009/053972 PCT/IL2008/001370 on "Modified Activated Carbon As Adsorbent For Anionic And Cationic Inorganic Pollutants" April 30, 2009 http://www.wipo.int/pctdb/en/wo.jsp?WO=2009053972
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20. **Rytwo, G.** (2013) US Patent and Continuation-in-part application No. 13/976,644, "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites"- filed August 15th, 2013 http://patents.justia.com/patent/20140042100
21. **Rytwo, G.** (2014) WIPO WO2015022695 No. PCT/IL2014/050738, "Method for Pretreatment of Wastewater and Recreational Water with Nanocomposites and Bridging Polymers", filed August 15th, 2014 https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2015022695
22. **Rytwo, G.,** Daskal, G. (2016) PCT/IL2015/050944, WO2016042558A1 based on UK Application No.1416495.8, "A system for treatment of polluted effluents"- September 17th, 2015 https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016042558
23. Gutman R, **Rytwo G**. (2017) Acicular clays and bio-composites based thereon for use in treatment of metabolic syndrome and related disorders. US provisional patent No. 62/588,664 re-filed November 20th, 2017.
24. Rytwo, G. (2018) US prov. 62/681,855 "Ambient temperature moderation by combining monitoring of heat flux with changes in heat transfer properties of the walls", filed 07.06.2018.
25. **Rytwo, G.** (2020) US prov. 63/005,531 "Modified activated carbon as a matrix for adsorption and deactivation of pathogens in masks and air filters" filed 04.04.2020

12. Participation in Scientific Conferences

1. Mahrer, Y.; Naot, O; Rytwo, G. (1990) Using an Evapotranspiration Model to Schedule Irrigation. Agritech 90, 5th. International Conference of Irrigation.
2. Rytwo, G.; Serban, C.; Nir, S.; Margulies, L. (1990) Use of organic cations (dyes) for determination of exchangeable cations in montmorillonite. Ann. Meeting Israel Society of Clay Research, Jerusalem.

3. Rytwo, G.; Nir, S.; and Margulies, L. (1992) Interactions of methylene blue, crystal violet and acriflavine with montmorillonite: adsorption and model calculations. Ann. Meeting Israel Society of Clay Research, Jerusalem.
4. Rytwo, G.; Nir, S.; and Margulies, L. (1994) Interactions of diquat and paraquat with montmorillonite: adsorption and model calculations. Ann. Meeting Israel Society of Clay Research, Jerusalem.
5. Nir, S.; G. Rytwo, L. Margulies, E. Ruiz-Hitzky, B. Casal, J. Merino, C. de Castro and J.M. Serratosa (1995) Modeling the adsorption of organic cations to sepiolite. Israeli-Spanish Workshop on "Organo-Clays: Structure, Properties and Uses", Ein Gedi.
6. Rytwo, G.; Nir, S.; and Margulies, L. (1995) Adsorption of divalent organic cations to montmorillonite. Israeli-Spanish Workshop on "Organo-Clays: Structure, Properties and Uses", Ein Gedi.
7. Nir, S.; G. Rytwo, L. Margulies, E. Ruiz-Hitzky, B. Casal, J. Merino, C. de Castro and J.M. Serratosa (1995) Modeling the adsorption of organic cations to sepiolite (poster). Euroclay '95, Leuven, Belgium.
8. Pulobesova, T.; Nir, S.; Rytwo, G.; and Margulies, L. (1996) Adsorption of benzyltrialkylammonium by Na-montmorillonite: experimental studies and model calculations. Ann. Meeting Israel Society of Clay Research, Tel Aviv.
9. Rytwo, G.; Nir, S.; and Margulies, L. (1997) Adsorption of the divalent herbicides DQ and PQ to montmorillonite. The First Seagram-CRMD Meeting on Soil, Water and Environmental Sciences, dedicated to the memory of the late Prof. Leon Margulies, Rehovot, Israel.
10. Rytwo, G.; S. Nir, D. Tropp, L. Margulies, E. Ruiz-Hitzky, B. Casal, J. Merino, C. de Castro and J.M. Serratosa (1998) Adsorption of monovalent and divalent organic cations to sepiolite. Ann. Meeting Israel Society of Clay Research, Rehovot.
11. Undabeytia, T.; Nir, S.; Rytwo, G.; Morillo, E. and C. Maqueda (1998). Modeling adsorption-desorption processes of Cd to montmorillonite. Ann. Meeting Israel Society of Clay Research, Rehovot.
12. Mishael Y.; Rytwo, G.; Nir, S.; Van Damme, H.; Bergaya, F.A.; and M. Crespin (1998). Interactions between monovalent organic cations and pillared clays. Ann. Meeting Israel Society of Clay Research, Rehovot.
13. Rytwo, G.; S. Nir; M. Crespin, L. Margulies (1998). Adsorption and interactions of methyl green with montmorillonite and sepiolite. 2nd Mediterranean Groups Clays Conference, Aveiro, Portugal.
14. Rytwo, G.; T. Undabeytia and S. Nir (1999). A model of adsorption of Cu to edge and planar sites of montmorillonite. 36th Clay Mineral Society Meeting, Purdue University, W. Lafayette, Indiana.
15. Rytwo, G.; S. Nir , D. Tropp, C. Serban and L. Margulies (1999). Adsorption of divalent organic cations on sepiolite. Euroclay ‘99, Krakow, Poland.
16. Rytwo, G.; S. Nir , D. Tropp, C. Serban and L. Margulies (1999). Adsorption of divalent organic cations on sepiolite. Soil Science Society of America Annual Meeting, Salt Lake City, Utah.
17. Nir, S., Undabeytia, T.; Yaron-Mercovich, D.; El-Nahal, Y.; Polubesova, T., Serban, C.; Rytwo, G.; Lagaly, G.; and B. Rubin (1999). Optimizing adsorption of hydrophobic herbicides on organo-clays, XIVth International Plant Protection Congress, Jerusalem, Israel.
18. Rytwo, G.; T. Undabeytia and S. Nir (2000). A model of adsorption of Cu to edge and planar sites of montmorillonite. Ann. Meeting Israel Society of Clay Research, Maalot.

19. Rytwo G., S. Nir and D. Tropp. (2000) The use of clay-organic interactions to improve efficacy of contact herbicides: addition of monovalent organocations to diquat. 37th Clay Mineral Society Meeting, Loyola University, Chicago, Illinois.
20. Rytwo, G. (2000) The use of clay-organic interactions to improve efficacy of contact herbicides: addition of monovalent organocations to divalent herbicides. ***Invited Lecture*** *in* the 1st Latin-American Clay Conference "Clays in Volcanic Environments", Funchal, Madeira.
21. Rytwo, G. (2001) Three simple experiments to demonstrate the important role of clay minerals on the behavior of organic pollutants in soils. Ann. Meeting Israel Society of Clay Research, Rehovot.
22. Mishael Y.G., Undabeytia T., Rytwo G., Papahadjopoulos-Sternberg B., Rubin B. and S. Nir (2001).Adsorption of Alkylammonium Cations as Monomers and Micelles on Montmorillonite. 38th Clay Mineral Society Meeting, Monona Terrace, Madison, Wisconsin.
23. Rytwo G. (2001). Three simple experiments to visualize the important role of clay minerals on the behavior of organic pollutants in soils. 12th International Clay Conference, Bahia Blanca, Argentina.
24. Tavasi M., Nir S., and G. Rytwo (2002) Adsorption of difenzoquat to montmorillonite. 39th Clay Mineral Society Meeting, Boulder, Colorado.
25. Nir S., Y. Mishael, T. Undabeytia, G. Rytwo, B. Papahadjopoulos-Sternberg, O. Rabinovitz, T. Polubesova & B. Rubin (2002) Clay-Micelles as a System for Solving Environmental and Agricultural Problems. 3rd Mediterranean Clay Meeting, Jerusalem, Israel.
26. Rytwo G. (2002) Testing the Gouy-Chapman-Stern adsorption model for adsorption of organic cations to soils. 3rd Mediterranean Clay Meeting, Jerusalem, Israel
27. Vulkan R., U. Yermiyahu, T. B. Kinraide, U. Mingelgrin, G. Rytwo. (2003) Binding and electrostatic attraction of copper and zinc to plasma membranes of wheat root. 7th International Conference on the Biogeochemistry of Trace Elements (7th ICOBTE), Uppsala, Sweden.
28. Rytwo G., S. Afuta, Y. Gonen and S. Dultz (2003) Formulation of pendimetahlin based on organo-smectite. Euroclay 2003, Modena, Italy.
29. Rytwo, G. (2004) A worksheet version for a GCS model for adsorption of ions on clay surfaces. Ann. Meeting Israel Society of Clay Research, Tel Hai.
30. Gonen, Y.; S. Nir and G. Rytwo (2004) Optimized organo-clays as the active blocking ingredient for anionic pollutants. Ann. Meeting Israel Society of Clay Research, Tel Hai.
31. Yermiyahu, U., T. B. Kinraide, U. Mingelgrin, G. Rytwo, R. Vulkan and S. Nir (2004) Binding and electrostatic attraction of cations to the surface of biological membranes. Ann. Meeting Israel Society of Clay Research, Tel Hai.
32. Rytwo, G. (2004) The use of clay-organic interactions to minimize environmental hazards of widely used herbicides in Hulah Valley soils. 6th Conference on New Galilee Studies, Tel Hai.
33. Rytwo, G. (2004) A worksheet model for adsorption-desorption of ions on clay surfaces. 41th Clay Mineral Society Meeting, Richland, Washington.
34. Rytwo, G; Gonen, Y. and students from 2003 Aquatic Environmental Chemistry Course. (2005) Anthropogenic influence on several water quality parameters, as measured an analyzed in students' experiments. 7th Conference on

New Galilee Studies, Tel Hai.

35. Rytwo, G. (2005) Exothermic and endothermic adsorption of dye molecules to clay minerals. Mediterranean Conference on Thermal Analysis and Calorimetry, MEDICTA 2005, Thessaloniki, Greece.
36. Vulkan R., Yermiyahu, U., Kinraide T.B., Mingelgrin U., Rytwo G. (2005) Sorption of Copper and Zinc to Plasma Membrane of Wheat Root. *69th Soil Science Society of America Annual Meeting.*
37. Gonen, Y. and G. Rytwo (2005) Assigning the dual mode model to adsorption of phenolic compounds on an Organoclay. Ann. Meeting Israel Society of Clay Research, Rehovot.
38. Rytwo, G. (2005) Thermodynamic processes on the adsorption of dye molecules to clays and organoclays. Ann. Meeting Israel Society of Clay Research, Rehovot.
39. Gonen, Y. and G. Rytwo (2006) Spectroni: A Matlab implemented algorithm for Spectrum deconvolution, ISRANALYTICA 2006, The 9th Annual Meeting of the Israel Analytical Chemistry Society, Tel Aviv.
40. Rytwo, G. and Y. Gonen (2006) The Use Of Organo- Smectite Nanoparticles For The Removal Of Phenolic Pollutants From Water. "Bridging Clays" combined 4th colloquium of the Groupe Francais des Argiles and 43rd Annual Meeting of the CMS. June 3-7, 2006 Poitiers/ Oleron Island, France.
41. Ramírez-Valle, V.; G. Rytwo; R. Huterer-Harari and J.L. Pérez-Rodríguez (2006) Study of the Interaction of Methylene Blue with Sonicated Vermiculite, 4th Mediterranean Clay Meeting, Ankara, Turkey.
42. Gonen, Y. and G. Rytwo (2007) A full analytical solution for the sorption/desorption kinetic process related to Langmuir equilibrium conditions. Ann. Meeting Israel Society of Clay Research, ARO, Bet Dagan.
43. Afuta, S. and G. Rytwo (2007) Test of various organoclays as possible platforms for metolachlor slow release formulations. Ann. Meeting Israel Society of Clay Research, ARO, Bet Dagan
44. Rytwo, G. and N. Lang (2007) Test of several clays for the fining of white wines. Ann. Meeting Israel Society of Clay Research, ARO, Bet Dagan
45. Rytwo G. 2007. Clay minerals: Ancient "nanotechnology"- a review of clay- organic applications along the centuries. ***Invited Lecture*** at International Workshop on PROGRESS IN HYBRID & BIOHYBRID NANOSTRUCTURED MATERIALS BASED ON CLAY MINERALS, Madrid, Spain
46. Gonen Y. and G. Rytwo. 2007. A full analytical solution for the sorption/desorption kinetic process related to Langmuir equilibrium conditions. Euroclay 2007, Aveiro, Portugal.
47. Rytwo G., 2007. Some misconceptions on environmental issues, an "open to public" lecture during "Researchers Night" Events, a joint program by several academic institutes and Israel Ministry of Science, together with several European countries. Kyriat Shmona, Israel. http://ec.europa.eu/research/researchersineurope/documents/rn07/nr07_israel1_en.pdf
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49. Rytwo G., S. Afuta, Y. Gonen, A, Mendelovitch and R. Ganigar, 2007. Use of mixed phases for the preparation of high active ingredient content clay-herbicide formulations. 45rd Annual Meeting of the CMS. April 5-10, 2008 New Orleans, LA, US.
50. Rytwo G. 2008. "Historical aspects of clay minerals usage in relation with nanotechnology". ***Invited Lecture*** at

Annual Meeting of the Clay Society of Spain (Sociedad Española de Arcillas, SEA) and the Mineralogical Society of Spain (Sociedad Española de Mineralogía SEM) Zaragoza, Spain, September 2008

51. Rytwo, G., Gonen, Y. and R. Huterer-Shweky. 2008. Degradation of crystal violet on VTx-1 vermiculite. Ann. Meeting Israel Society of Clay Research, Sde Boker.
52. Rytwo G., 2008. Advanced techniques of water purification, an "open to public" lecture during "Researchers Night" Events, a joint program by several academic institutes and Israel Ministry of Science, with several European countries. Kyriat Shmona, Israel. http://ec.europa.eu/research/researchersineurope/events/researchersnight08/events_en.htm
53. Rytwo, G., 2009. FTIR spectroscopy: Some Uses and Applications in Environmental Sciences. BARGAL Analytical Equipment INCUBATORS 2009 Meeting, September 2nd, Tel Aviv University.
54. Rytwo G. 2009. Explanatory experiments of the influence of thermodynamics parameters on sorption on clay minerals. 14th International Clay Conference, Italy.
55. Rytwo, G., 2010. "*Lets talk about water"* an open-to-public lecture on water pollution, amounts, desalination and other water related issues. Maayan Baruch, 1.2.2010.
56. Rytwo, G., 2010. FTIR spectroscopy: Principles and applications in clay-organic interactions. ***Invited lecture*** at 2010-Trilateral (USA-Japan-Spain) Meeting on Clays (2010TMC), Madrid-Seville, Spain.
57. Rytwo, G., 2010. Water pollution, amounts, desalination and other water related issues, delivered to Michigan State University Students, "Green Environment" Course, Coordinated by Prof. Eric Aronoff. Tel Hai, June 2010.
58. Rytwo, G. 2010. Use of nanoparticles for efficient TSS removal in organically loaded effluents. SWAM FP7 European Project, 2ND meeting, Patras, Greece www.swam-project.eu
59. Rytwo, G., 2010. "*Misconceptions in Environmental Issues"* an open-to-public lecture on Climate Change, Water, Energy, and other Environmental issues. Katzrin, 26.10.2010.
60. Rytwo, G.; Mendelovits, A.; Elihau, D.; Pitcovski J. and Aizenshtein, E. 2011. Adsoption of two vaccine-related proteins to montmorillonite and organo-montmorillonite. Hybrid Materials 2011, Strasbourg, France.
61. Rytwo, G., 2011. "*Misconceptions in Environmental Issues"* an open-to-public lecture on Water pollution, amounts, desalination and other water related issues. *Kafe-Mada ("Science Coffee"),* Kiryat Shmona, 26.2.2011.
62. Rytwo, G., 2011. "*The use of nanocomposites for the pretreatment of industrial effluents"* Water resources in the Galilee, Israel and the Middle East Conference*,* Tel Hai, 26.6.2011.
63. Rytwo, G.; Mendelovits, A.; Elihau, D.; Pitcovski J. and Aizenshtein, E. 2011. Adsoption of two vaccine-related proteins to montmorillonite and organo-montmorillonite. Clay Mineral Society Annual Meeting, Lake Tahoe, USA, September 2011.
64. Rytwo G. 2011. "Ancient nanotechnology applications: What connects between the Romans' fullers and the Maya Blue?" "Researchers Night" Events, a joint program by several academic institutes and Israel Ministry of Science, together with several European countries. Kyriat Shmona, Israel. http://www.facebook.com/event.php?eid=269041886453231
65. Rytwo, G., 2011. "*Aiming Water Reuse: Nanocomposites for the pretreatment of industrial effluents" at the* Ann. Meeting Israel Society of Clay Research, Upper Galilee, October 2011.
66. Rytwo, G.; Mendelovits, A.; Elihau, D.; Pitcovski J. and Aizenshtein, E. 2011. Adsoption of two vaccine-related

proteins to montmorillonite and organo-montmorillonite. 2nd Bio-medicine Galilee Conference, October 2011, Tel Hai, Israel.

67. Rytwo, G. 2012. The use of clay-polymer nanocomposites in wastewater pretreatment. American Chemical Society 243rd Meeting, March 2012, San Diego, US
68. Rytwo, G. 2012.Clay polymer nanocomposites in coagoflocculation processes. 49th Clay Mineral Society Annual Meeting, Golden, CO, USA, July 2012.
69. Rytwo G. 2012. "Nuclear energy, Black holes and the uncertainty of the cat. The conceptual revolution of Modern Physics" "Researchers Night" Events, a joint program by several academic institutes and Israel Ministry of Science, sponsored also by the European Community. Kyriat Shmona, Israel. http://most.gov.il/ScienceAndCommunity/researchersnight/Documents/Migal%20program.pdf
70. Rytwo, G., Lavi, R. and König: Influence of Freezing OMW on its pretreatment. Olive Oil Wastes and Environmental Protection Symposium, Chania Greece, 2012. http://dx.doi.org/10.13140/RG.2.2.14718.48968
71. Rytwo, G. and MISSTOW team: MISSTOW- a mobile plant for wastewater treatment: Olive oil and environmental protection, in "The First Olive Oil Harvest Event" organized by "Olive Division", Ginossar 15.1.2013
72. Rytwo, G., Prat, T., Margalit, S., König, T., Zakai, R., and Wicklein, B. (2013) ATR-FTIR use for quantification of adsorbed organic compounds. In ISRANALYTICA 16th Annual Meeting for Analytical Chemistry http://bioforumconf.com/analytica-abs/out_of_pdf/atr-ftirusefo_Giora_Rytwo.pdf, Tel Aviv, Israel http://dx.doi.org/10.13140/2.1.3033.7281
73. Rytwo, G. (2013) **Invited lecture,** Dispersion analysis in wastewater treatment, International Workshop on Dispersion Analysis, March 2013, Berlin.
74. Rytwo, G. and MISSTOW team: MISSTOW- a mobile plant for wastewater treatment: Application in wineries, in " 4th Israeli Wine Meeting", Rosh Pinna, 2.5.2013
75. Rytwo, G. and MISSTOW team: MISSTOW- a comprehensive possible solution to olive mill wastewater, in " Olive mill wastes – from nuisance to resource" Meeting, Bet Dagan, 12.6.2013
76. Rytwo, G., CLAYS, WATER AND ENVIRONMENT: AN INTERESTING TRIANGLE WITH MUTUAL INTERACTIONS, MEDGEO 2013, 5th International Conference in Medical Geology, Arlington, VA Aug. 25-29, 2013.
77. Rytwo, G. Clarification of olive mill, winery, dairy and cowshed wastewater by means of clay polymer nanocomposites, HINT Workshop The interface in hybrid and biohybrid materials : role and characterization, 2-3 September 2013, Madrid, SPAIN
78. Rytwo G., Yaish D., Samuels M. and Mor, O. Are metachromasy and photostabilization related? 50th Anniversary Annual Meeting of The Clay Minerals Society (CMS 2013), October 2013, Urbana, IL. http://dx.doi.org/*10.13140/2.1.4665.4084*
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80. Rytwo, G., Lavi, R., Konovalova, Y., Gutman, R. 2014. Adsorption of olive oil on clay minerals and nanocomposites. 51th Anniversary Annual Meeting of The Clay Minerals Society (CMS 2013), May 2014, College Station, TX.

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82. Rytwo, G. The use of hybrid organoclays and nanocomposites for slow release of high vapor pressure compounds, HINT Workshop: Role of interface in synthesis and applications, 16-18 June 2014, Turku, Finland
83. Rytwo, G; Malka, H., A pilot plant for the removal of suspended solids in cowshed wastewater, 26th Annual Israel Cattle Growers Meeting, Ashkelon, Israel, October 2014
84. Rytwo, G. **Invited lecture,** The use of an X-ray dispersion analyzer to study sedimentation patterns: clay minerals as an example, International Workshop on Dispersion Analysis January 2015, Berlin. http://doi.org/10.13140/2.1.3983.3920
85. Rytwo, G. 2015. Environmentally oriented formulations of pesticides. 17th Conference on New Galilee Studies, Tel Hai
86. Rytwo, G. 2015. **KEYNOTE LECTURER:** *The "magic" in environmental applications of clay based materials***,** at EUROCLAY 2015, A joint meeting of the European Clay Groups Association and The Clay Minerals Society, joined by the International Natural Zeolites Association and the Geological Society: July 2015, Edinburgh, UK. http://www.euroclay2015.org/Programme
87. Rytwo, G., 2015**,** The use of an X-ray dispersion analyzer to study sedimentation patterns: clay minerals as an example, at the 250th American Chemical Society National Meeting & Exposition, in Boston, MA, August 2015. https://youtu.be/esL6Mpmup1w
88. Rytwo, G., 2015**,** A continuous-flow device for photocatalytic degradation and full mineralization of priority pollutants in water, at the 250th American Chemical Society National Meeting & Exposition, in Boston, MA, August 2015. https://youtu.be/hX9554YVrsg
89. Rytwo, G., Sitruk, A., Lavi, R., Khamaisi, H. and Gutman, R. 2015 De-emulsification of oil emulsions by clays and nanocomposites, 5th Galilee Biomedical Conference, Tel Hai, 7th October 2015
90. Rytwo, G., Sitruk, A., Lavi, R., Khamaisi, H. and Gutman, R. 2015 De-emulsification of oil emulsions by clays and nanocomposites, EU COST-HINT Scientific Workshop and Review Meeting, Milan 12-14 Oct 2015.
91. Rytwo, G. 2016. "The use of hybrid clay-polymer nanocomposites for the clarification of wastewater". Seminar at the Institut de Chimie de Clermont-Ferrand, UMR CNRS 6296, Université Blaise Pascal, February 2016.
92. Rytwo, G. 2016. "Confronting regional water scarcity". Seminar at the Department of Environmental Sciences Bioenvironmental Engineering Rutgers, The State University of New Jersey, June 2016.
93. Rytwo, G., Sitruk, A., Lavi, R., Khamaisi, H. and Gutman, R. 2016 De-emulsification of oil emulsions by clays and nanocomposites, 8th Mid-European Clay Conference, 4-8 July 2016, Košice, Slovakia. http://dx.doi.org/10.13140/RG.2.2.15149.92645
94. Rytwo, G. Suspended solids removal: demonstration of dose influence on wastewater effluents. Annual Israel Society of Ecology and Environmental Science (ISEES) Conference, July 2017, Tel Aviv, Israel.
95. Rytwo, G. Hybrid clay-polymer nanocomposites for the clarification of water and effluents. **Keynote lecture**, Clays,

organoclays and nanocomposites in water treatment session at 16th International Clay Conference, July 2017, Granada, Spain. http://dx.doi.org/10.13140/RG.2.2.11992.19202

96. Rytwo, G. From the "Idea" stage toward the "Product" production. From scientific research to applied projects. **Invited Lecture,** 7th Entrepreneurship Conference, Tel Hai College, January 3rd, 2018 (in Hebrew).
97. Rytwo, G. FTIR based quantification of adsorbed organic compounds on clays. **Invited Lecture,** Applications of Infrared Spectroscopy to Clay Mineral Systems Session at the 55th Annual Meeting of The Clay Minerals Society (CMS), University of Illinois at Urbana-Champaign (UIUC), June 11-14, 2018. http://dx.doi.org/10.13140/RG.2.2.30447.12960
98. Rytwo, G. 2018. "Coping with Water Crises: New Cleantech Water Technologies" **Invited lecture** at "Israel at 70 mini-conference" to be held at Michigan State University for September 16-17, 2018.
99. Rytwo, G., Kramer, T., Azoulay, L., Shaltiel-Harpaz, L. 2020. Novel insecticides based on essential oils and clay. The 4th Asian Clay Conference (ACC-2020), June 2020, Online-conference, The Royal Cruise Hotel Pattaya, Thailand.
100. Rytwo, G. 2020. Use of clay-polymer nanocomposites in water and wastewater treatment. Internal lecture for GES (Global Environment Solutions LTD.) towards license agreement with MIGAL. August, 2020.
101. Rytwo, G., Kramer, T., Azoulay, L., Shaltiel-Harpaz, L. 2020. Novel insecticides based on essential oils and clay. Israel Society of Soil Science Online-conference, December 2020 Israel.
102. Shaltiel-Harpaz, L.; Kramer, T.; Dudai, N.; Rytwo, G. 2021. Novel Botanical Insecticides Based on Essential Oils and Clay. In Second International Congress of Biological Control (ICBC2); Davos, Switzerland, 2021.
103. Rytwo, G., Kramer, T., Azoulay, L., Shaltiel-Harpaz, L. Efficient insecticides based on essential oils and clay, American Chemical Society (ACS) Fall Meeting, 2021, Atlanta, GA, August 2021
104. Rytwo, G. Applying FTIR spectroscopy for characterizing clay-organic interactions. **Invited lecture** at Workshop on the Analysis of Clay and Oxide Surface Chemistry, Israel Society for Clay Mineral Research, August 2021.
105. Rytwo, G.*, Levy, S., Shahar, Y., Lotan, I., Zelkind, A.L, Klein, T & Barak C. 2021. Health protection using clay minerals: a case study based on the removal of BPA and BPS from water. **Invited lecture** at International Workshop on Clay Minerals in Healthcare Applications, 58th Annual CMS meeting (*online*), October 2021
106. Rytwo, G., Kramer, T., Azoulay, L., Shaltiel-Harpaz, L. 2022. Sepiolite- rosemary oil combination as an environmentally oriented insecticide. XVII International Clay Conference (ICC2022), İstanbul, Turkey, July 2022.
107. Rytwo, G. Photocatalytic degradation of priority pollutants. TREWAG2022 BARD Symposium, Hagoshrim, Israel, October 2022.
108. Rytwo, G. 2024. "Coping with Water Crises: New Cleantech Water Technologies" **Invited lecture** at GNS Taupo Institute, New Zealand.
109. Rytwo, G., Hadad, A., Abramovici, A., Levi-Lion, A., Dimant, E., Hadari, P., Steckler, R. and Degani, O. 2025. Clay-based formulation of azoxystrobin to control corn late wilt disease and cotton coal rot disease. 18th International Clay Conference, July 2025, Dublin, Ireland.
110. Rytwo, G.; Tsveher, Y.; Viner-Mozzini, Y.; Sukenik, A. 2026. Application of Clay-Polymer Nanocomposites for the Removal of Toxic Cyanobacteria and Other Phytoplankton from Water – A Laboratory Scale Study. 2026 Meeting of The Clay Minerals Society (CMS), Provo, UT, July 7-11, 2026.

13. Research Interests

1. Thermodynamic and kinetics in sorption and desorption processes.
2. Adsorption modeling to colloids, charged or neutral surfaces.
3. Removal of organic and inorganic pollutants from waters by means of organo-clays, nanocomposite or other sorbents: development of filtration techniques.
4. Educational applications of aquatic environmental chemistry techniques
5. Spectroscopy (FTIR, UV-Vis, ICP, XRF, turbidity) methods in analytical chemistry.
6. Use of tailor-made nanocomposites for the removal of suspended materials in food industry sewage (olive mills, dairy, wineries, etc.), and potable water (including partial disinfection)
7. Additional applications of clays, organoclays and nanocomposites as slow-release platforms (herbicides, fragrance, fertilizers, proteins, medications, etc.).
8. Photostabilization and photocatalyzed degradation of chemicals on colloidal surfaces, including submission of a grant on the photocatalytic degradation of emerging micropollutants.
9. International cooperation and on Micro- and Nanoplatics at the European Union (COST action).
10. Energy balance and heat diffusion through matrices.

14. Referees

- Prof. Shlomo Nir, Seagram Center for Soil and Water Research, Faculty of Agriculture, Hebrew University of Jerusalem nir1@agri.huji.ac.il
- Prof. Eduardo RUIZ-HITZKY, Instituto de Ciencia de Materiales de Madrid, CSIC, Cantoblanco, 28049 ,Madrid, SPAIN eduardo@icmm.csic.es
- Prof. Ray E. Ferrell, Geology Department, Louisiana State University, USA. Telephone: (225) 578-5306 Fax: (225) 578-2302, Email: rferrell@lsu.edu
- Prof. Makoto Ogawa, Dept. of Earth Sciences, Waseda University, Japan, makoto@waseda.jp
- Prof. Gerhard LAGALY, Inst. Inorganic Chemistry, University of Kiel, Kiel 24098, Germany. h.mittag@email.uni-kiel.de
- Dr. Stefan DULTZ, Institute for Soil Sciences, University of Hannover, Germany, dultz@ifbk.uni-hannover.de

15. Miscellaneous

Additional Publications

- Rytwo, G. (1987) *Shedamot,* **103/104** 68-76 (in Hebrew)
- Rytwo, G.; Mahrer, Y. (1991) Determination of Irrigation Quantities by Use of Eddy Correlation Method in Drip, Daily Irrigated Cotton Field. *Hassade*, **70**, 1135-1138 (in Hebrew)
- Rytwo G., (2008) Some misconceptions about environmental issues, *Galileo* 121: 34-42 (in Hebrew)
- **Rytwo, G.;** Malka, H. (2013) A pilot plant for the treatment of cowshed effluents**,** Water and Irrigation, **530**: 6-9 http://www.studio-appel.com/ebooks/nobel/maim/october13/#p=43

- **Rytwo, G.;** Avidan, L., Konig, T., Lavi, R., Levi, M., Malka, H. (2014) A pilot plant for the treatment of cowshed effluents by nanocomposites, Israel Cattle Breeders' Association **(ICBA)** Magazine, **370:** 98-100 http://www.icba.org.il/noa/meshek/0370/files/98.html (in Hebrew)

- Additional 10 short publications in daily or weekly newspapers, focusing on diverse environmental actual issues.

Scholarships and Prizes:

1. Dean's list, 1982/3.
2. Dean's list, 1984/5.
3. Bona Terra Foundation Scholarship, 1990-1991.
4. Fishman-Nadel Foundation Prize, 1991-1992.
5. Upper Galilee Council Scholarship, 1994.
6. Sacta-Rashi Foundation Guastella Scholarship ($60000) for excellence in research in colleges, 1999-2002
7. Diploma for Excellence in Teaching, 2000-2001, Faculty of Sciences and Technology, Tel Hai College
8. Diploma for Excellence in Teaching, 2005-2006, Faculty Sciences and Technology, Tel Hai College
9. Invited to Mr. Shimon Peres, Israeli's President 2011 "Sukkoth" Event, to present the use of nanocomposites for effluents purification.
10. Diploma for Excellence in Teaching, 2010-2011, Faculty Sciences and Technology, Tel Hai College
11. Mentored Mrs. Maya Samuels (from Har VaGai School) on a study on Stabilization and Metachromasy of adsorbed dyes on clays. Maya earned with the project performed under my supervision the following prizes (a) the Gur Arieh Israeli Ministry of Education 2011 Prize, (b) the Intel ISEF 4th award in Chemistry 2011 competition (c) Davidson Institute at Weizzmann Academy – 1st prize, and (d) was chosen to participate in the Stockholm International Youth Science Seminar (SIYSS) and present the study at the 2011 Nobel Prize Ceremony in Stockholm. Additional information in the following sources: English version of an Israeli newspaper , Interlochen website) and Technion Institute "Focus" magazine
12. Diploma for Excellence in Teaching, 2014-2015, Faculty Sciences and Technology, Tel Hai College
13. Award for Excellence in Applicative Research, 2015, MIGAL Galilee Research Institute
14. Diploma for Excellence in Teaching, 2020-2021, Faculty Sciences and Technology, Tel Hai College
15. **Recognized leadership in industrial innovation**: There are three major industrial contributions that can be ascribed directly to my research (a) A technology I am its senior inventor, that uses modified activated carbon for the removal of heavy metals and oxyanions in industrial and potable is applied by ToxSorb Co., a water technology "Cleantech" company that works since 2008 (company website), with clients in Israel, Italy and USA (WO/2009/053972 PCT/IL2008/001370). (b) A technology I am its sole inventor, based on the development of specifically designed clay-polymer nanocomposites for the clarification of water is the basis of several patents (PCT/IL2012/000245 WO2012176190, PCT/IL2014/050738 WO2015022695, PCT/IL2016/050700 WO/2017/158581), most of them already at Granted in Israel, US, Europe and other places. The license for the use of the technology in wastewater and effluents was assigned in 2017 to ICL Haifa that introduced a product known as "NC" to the industrial and domestic wastewater treatment in Israel

and around the world (additional information in this press release, and at the following advertising movies: 1, 2). Later the license was given to Safepack-Decco, and since 2020 to GES. (c) Advanced negotiations about an industrially supported proposal are being held with a large water treatment company based on the photocatalytic degradation technology developed in European granted patent based on PCT/IL2015/050944, WO2016042558 is taking place (July, 2020). A Channel 10 television report on the technology (in Hebrew) was broadcasted on October, 3rd, 2017. All those recognized achievements in the field of water treatment and technology had made Prof. Rytwo a known lecturer and consultant on the field, and lead the Israel Standards Institute to invite him to participate as an Academic's representative in the Water Quality Standards Committee, a position he left after being assigned Head of the Research Authority at his Institute

16. **Unconventional Career Path:** As mentioned above Since 2012 worked jointly with industries in the development of the use of nanocomposites for the clarification of wastewater and effluents, a project that matured to the manufacturing of "NC" mentioned above. During the years 2012-2016 ICL Innovation, later ICL Haifa, later Decco Safepack, and recently GES Ltd. invested more than 500000 € in industrial research performed in our laboratory. Due to the intensity and IP limitations of applied projects that yielded granted patents and applications described above, most of the work done could not lead to peer-reviewed publications. With the launching of the commercial marketing of "NC" in 2016, I resumed work for scientific publications, and indeed in the last three years participated in the publication of more than 15 peer reviewed publications, most of them as senior or corresponding author and in Q1 Journals. Extensive cooperation with other researches (MIGAL/Tel Hai, Technion, Galilee Society, etc.) leaded to additional recent published and submitted works.