

Personal information

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Education

October 2015- November 2018 (Discussion 18th February 2019)

PhD in Chemical Engineering, qualification of Doctor Europaeus at the Department of Chemical Engineering Materials Environment of University of Roma “La Sapienza”. With Honors (Title: **Process Intensification: nZVI Production and Application in Environmental Processes**).

October 2013- July 2015

Master of Engineering in Environmental Engineering-Hydraulic Degree, Faculty of Civil and Industrial Engineering, University of Roma “La Sapienza”. With Honors (110/110 cum Laude) and Excellence.

November 2010-July 2013

Bachelor of Science in Environmental Engineering, Faculty of Civil and Industrial Engineering, University of Roma “La Sapienza”. 108/110.

Awards

Excellence Path, to get the access to the Excellence path students must maintain the arithmetic mean of their marks higher than 28/30, they must graduate in two year attending more courses or doing a project which will be present to a commission of Professors. Only three out 100 students were awarded.

Scholarship from CRAL association of Mi.P.A.A.F. (Ministry of Agriculture and Forests), the award was for students who took the MscEng in 2 years and with the highest mark (110/110 cum Laude).

Doctor Europaeus, the requirements to be met are based on those recommended by the European University Association in 2005 and comprise the points: (i) Intra-European co-

supervision of the doctoral dissertation project by two professors from different EU countries or EU associates (excluding Italy) in addition to supervision by a member of Sapienza; (ii) Intra-European assessment of the dissertation by two professors (usually the two co-supervising professors) from different EU countries or EU associates (excluding Italy) in addition to assessment by a member of the Sapienza; (iii) Intra-European multilingualism, i.e. the candidate must demonstrate linguistic skills in at least three of the 24 official languages of the EU. At least two of these languages must be used in defending the dissertation. (iv) Intra-European research mobility, i.e. at least three months must be spent abroad for the purpose of research at the research institutes of the two co-supervisors in their respective EU countries or EU associates. (v) Intra-European composition of the examination committee: the examination committee must consist of authorised examiners from three EU countries (including Italy), whereby the committee should usually include the three supervisors.

Academic Position

2016-2019

PhD students delegate.

December 2018-today

PostDoc researcher (Assegnista di Ricerca ING-IND/25) at Department of Chemical Engineering Materials Environment.

2020-today

Lecturer of the course in the Master of Chemical Engineering (Computer Aided Process Control) at University of Rome La Sapienza.

Qualified as Associate Professor (09/D3 Industrial Chemical Plants and Processes).

Associations

2020-today

Member of AIDIC management board.

2018-2019

President of working group Young AIDIC.

2018-today

Member of EuroScience.

2017-today

Member of Italian Association of Chemical Engineering (AIDIC).

Academic Experience Abroad

2014

Oxford (UK), visiting student.

May 2017-July 2017/June 2018-August 2018

University of Granada, Department of Chemical Engineering.

The research activity was carried out in collaboration with the research team of Prof. Martinez-Ferez and Prof. Ochando-Pulido. During the period spent in the laboratories of Granada University new experiments, regarding the production of a new class of adsorbent coated by iron and magnetite nanoparticle, were performed. The production processes were carried out in stirred tank reactors and the adsorbents were utilized in lab-scale adsorption columns and pilot-scale ones. The treated wastewaters derived from tannery industries.

Academic activity and Classes

A.A. 2015/2016

4 h of exercitations in the course of *Materials Science and Applied Chemistry* (Prof. Di Palma) for Bachelor students in Energetic Engineering.

A.A. 2016/2017

4 h of exercitations in the course of *Materials Science and Applied Chemistry* (Prof. Di Palma) for Bachelor students in Energetic Engineering.

6 h of exercitations in the course of *Laboratory of micro/nano-particles* (Prof. de Caprariis) for Master students in Nanotechnology Engineering.

A.A. 2017/2018

6 h of exercitations in the course of *Laboratory of micro/nano-particles* (Prof. de Caprariis) for Master students in Nanotechnology Engineering.

A.A. 2018/2019

7 h of seminars for the PhD students of Chemical Engineering in the course *FEM Application for Chemical Engineers*.

6 h of lessons/seminars in the course of *Laboratory of micro/nano-particles* (Prof. de Caprariis) for Master students in Nanotechnology Engineering.

Seminars (30 h) on Fluid Machinery Applied to Chemical Industry (Control and Maintenance) for Master students in Chemical Engineering.

A.A. 2019/2020

Lecturer (2 h seminars) Intensified Production of Nanoparticles for the students of the PhD Course in Electrical, Materials, Raw Materials and Nanotechnology.

Lecturer (10 h of lessons, Course Responsible) of the course of *Power to Gas: Plant Unit Design and Exergy Analysis* for the students of the PhD Course in Energy and Environment.

A.A. 2020/2021

Lecturer (40 h) of the course *Computer Aided Process Control*, Master of Chemical Engineering, University of Rome La Sapienza.

Lecturer (6 h) of the course *Exergy and Energy Analysis for the Optimization of Industrial Plants*, PhD Course Chemical Processes for the Industry and the Environment, University of Rome La Sapienza.

Professional Activity

July 2013-October 2013

Apprenticeship in a hydraulic tunnel construction site (I worked on centrifugal pumps and compressors control, maintenance and design)-IM.P.R.E.D.I.R. S.r.l.

2013-2015

Support in some industrial and civil sites for the centrifugal pumps and compressors control, maintenance and design activities.

2015

Engineering Professional Exam.

2015-today

Support to various civil and chemical engineering enterprises for: optimization and evaluation of calcium hydroxide soil treatment mixing process (Procopio S.r.l., Cogecon s.r.l. and Carchella s.p.a.) and spinning disk reactor equipment design and control (Labor S.r.l.). From 2018 he started to support GEEG S.r.l., taking care about chemical/environmental engineering activities (management).

Company Founder

Founder business partner of Start-Up GEEG S.r.l. of Sapienza University of Rome (2018)

<https://www.geeg.it/>.

Technical skills

Fluid transport system design.

Design and control of process units, such as pumps, compressors, crystallizers, evaporators, batch or continuous reactors etc.

Chemical and physical characterization of wastewaters, solid waste, sediments and soil (EPA methods and CNR-IRSA methods as acid and alkaline digestion, Soxhlet extraction, CEC, TOC,

COD, BOD₅, granulometric analysis...). Nano-particles production in isotherm batch reactors and in continuous (SDR). Activated sludge isotherm batch reactor management. Soil conditioning by surfactants and polymers related to the Earth Pressure Balance (EPB) tunnel boring technology.

Instruments: TOC analyzer, Uv-Vis spectrophotometry, Flame Atomic Absorption Spectroscopy (FAAS), Ionic Chromatography, Kjeldahl Distillation Unit (Ammonium analysis), Thermoreactors for Nitrogen and COD analysis.

Software: Comsol Multiphysics, gPROMS, PROII, Aspen Plus, Aspen Hysys, EPANET, EPASWIM, SAP2000, Draftsight, Python, Excel.

Languages

English (B2/C1) IELTS 7./9.

Spanish (B1/B2).

Conferences and Oral Presentations

2014

1. *Mamiani Scientific High School, Rome*

Oral presentation about the Environmental Engineering degree, the different technical abilities which students could learn and the opportunity to open their horizons.

2015

2. *Teatro Petrolini, Viterbo*

Unique speaker in the disclosure day organized by the Italian Association of Chemical Engineers "Water: use and issues"; the lesson dealt with Hydrologic cycle and the chemical-physical processes to remove arsenic (As) from wastewater and drinking water.

3. *12th International Conference on Chemical and Process Engineering (ICHEAP), Milan*

Speaker.

4. *Workshop at Astaldi Company headquarter, Rome*

Speaker.

2016

5. *1st INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY BASED INNOVATIVE APPLICATIONS FOR THE ENVIRONMENT (NINE), Rome*

Speaker.

Curriculum Vitae Giorgio Vilardi

6. *13th International Conference on Protection and Restoration of the Environment, Greece*

Speaker.

7. *Congress GRICU 2016 "Gli orizzonti 2020 dell'Ingegneria Chimica" Anacapri (NA).*

Speaker.

8. *NanoInnovation, Rome*

Participant.

9. *Ecomondo, Rimini*

Speaker.

2017

10. *Tecnologie chimiche e biologiche per la protezione ambientale "LA SAPIENZA", Rome*

Speaker.

11. *Circular Economy - Nuovi approcci, nuove opportunità "LA SAPIENZA", Rome*

Speaker.

12. *CEST (15th International Conference on Environmental Science And Technology), Rodhos, Greece*

Speaker.

13. *13th ICHEAP, Milan*

Speaker.

14. *2nd NINE, Rome*

Speaker and Chairman.

15. *NanoInnovation, "LA SAPIENZA", Rome*

Participant.

2018

16. *Zwick Academia Day, "LA SAPIENZA", Rome*

Speaker.

17. *Congress GRICU Pisa*

Participant.

18. *23rd CHISA e 21st PRES, Praga, Czech Republic*

Speaker.

19. *NanoInnovation, "LA SAPIENZA", Rome*

Participant.

2019

20. *Workshop "D.P.R.120/2017 Gestione delle Terre e Rocce da Scavo", CNR, Rome*

Speaker.

21. *3rd NINE, Naples*

Speaker.

22. *CEST (16th International Conference on Environmental Science And Technology), Rodi, Greece*

Speaker.

23. *ECCE (12th European Congress of Chemical Engineering), Florence*

Speaker and International Student Committee Coordinator.

2020

24. *The First World Energies Forum (Online Conference), Rome.*

Peer-reviewed proceeding.

2021

24. *Catalysis and Chemical Engineering Conference 2021 (Online Conference in California, USA).*

Invited Speaker.

Industrial Patents

Italian Patent (Sapienza) n° 102018000004256 "Protected metallic oxidizable particle production process".

Extension of Italian Patent n° 102018000004256 (W02019193490), (present on Espacenet Database).

Italian Patent (Sapienza) n° 102019000022335 "Hybrid Reactor for the production of submicronic and nano-sized particles packed in inorganic/organic solid crystallized matrix".

Spanish Patent (50% Sapienza/50% UGR) n° P201931030 "PROCEDIMIENTO DE PREPARACIÓN DE NANOPARTÍCULAS METÁLICAS CON ALTA CAPACIDAD REDUCTORA"

Italian Patent (Sapienza) n° 102020000007141 "Micro and nano-zeolites production procedure by means of a spinning disk reactor".

Research Projects

Principal Investigator of PhD Student research program “*Treatment of Cr(VI)-polluted soil by means of zerovalent iron nanoparticles in aqueous carboxymethylcellulose dispersion*”, Sapienza University Funded Project (1000 euros)-2016.

Operative Responsible of the national project in collaboration with ENEA “*Power-to-Gas: dynamic analysis of catalytic methanation reactors and control strategy development*”, Italian Minister of Education, University and Research Funded Project (80000 euros)-2020.

Participation to “*Heavy metals removal from wastewater by iron-based nanoparticles stabilized by biopolymers*”, Sapienza University Funded Project (53750 euros)-2017.

Participation to “*Hexavalent chromium reduction in contaminated soil by nanoscale zero-valent iron*”, Sapienza University Funded Project (30000 euros)-2015.

Participation to “*Computational fluid dynamics study of rotating reactive liquid in spinning disk reactor and stirred tank reactor: influence of hydrodynamic fields on nanoparticles production*”, Sapienza University Funded Project (10000 euros)-2018.

Participation to “*Exergetic analysis of hydrogen production by water splitting on manganese ferrite-sodium carbonate mixture*”, Sapienza University Funded Project (15000 euros)-2018.

Participation to “*Carbon Capture Storage and Utilization: recovery of carbon dioxide from power plant flue gas and re-utilization in the same cycle. Simulation and experimental activities using porous adsorbents for CO₂ sequestration*”, Sapienza University Funded Project (14000 euros)-2020.

Participation to Research Contract with Ramboll Environ Italy “*Experimental assessment of the feasibility of dechlorination and oxidation processes of pollutants in contaminated groundwater aimed at implementing the remediation project in the Selex MBDA site in Fusaro*”, (Ramboll Environ Italy-18000 euro)-2017.

Collaboration to the European Project Tempus Econano.

Participation to the European Project ERANETMED_WATER-13-051 CRITERIA (66000 euros).

Work Package Coordinator (WP10) in the European Project Innovative Training Center to support a 3rd cycle Advanced Education Course to face Environmental Emergency in Azerbaijan (ITACA-about 980000 euros)-2019.

Co-Supervisor of Master Engineering Thesis

1. Bimetallic nanoparticles for nitrate removal in aqueous solution (M. Terzino).
2. Kinetic modelling of Cr(VI) reduction process by nZVI in aqueous solution in CSTR (A. Ferri).

3. Kinetic modelling of Cr(VI) reduction process in polluted soil by nZVI slurry in CSTR (M. Pompei).
4. Agro-industrial waste sorbent for the recovery of heavy metals in aqueous solution (A. M. Mancini).
5. Up-grade of wastewater treatment plant of bio-plymers production plant by novel oxidation unit (A. Meloni).
6. Photochemical processes for the oxidation of surfactants in wastewaters (G. De Quattro).
7. ISCO processes development and kinetic modelling (F. Fusco).
8. Intensified production of nZVI by Spinning Disk Reactor technology: scale-up and modelling (E. Moroni).
9. Integrated plant for lead recovery by suspended nZVI. Reactor scale-up and modelling (A. Dolfelli).
10. Surfactants removal by heterogeneous Fenton process development with nZVI. Oxidation reactor design and scale-up (A. Nucera).
11. Intensified denitrification process by Spinning Disk Reactor Technology (A. Festa).
12. Ni recovery from wastewaters by waste biomass. Kinetic modelling and PFR design (L. Palleschi).
13. Chemical oxidation of surfactants in polluted soil in slurry reactors. Reactor design and scale-up (L. Ferri).
14. Risk analysis of two cargo ships impact transporting NH_4NO_3 and LPG: model development and experimental tests for a possible site remediation (M. Terzino).
15. nZnO intensified production by Spinning Disk Reactor and seeding crystallization of organic salts on nanoparticles. Fluid dynamics modelling crystallizer design (I. A. Korsaye).
16. Nano-magnetite intensified production by Spinning Disk Reactor. Mixing process modelling (A. Tozzi).
17. Industrial sludge pre-treatment and disinfection by Cu-catalyzed Fenton-like process in jacketed CSTR. Reactor and heat exchange system modelling and scale-up (B. Adriani).
18. Special heat exchanger unit and control system design for Salts & Solution site of BASF-Italy (V. Murana).
19. Design and exergonomical comparison of two plants of hydrides and metal steam reforming nano-catalysts production plants (R. Di Camillo).

20. Exergetic analysis of municipal waste incineration plant with flue gas recirculation (M. Tasciotti).
21. Dynamic analysis of catalytic PFR for methanation process-P2G technology (G. Bianchi).
22. Exergetic analysis of four biogas upgrade processes and plants (M. Pioni).
23. Multiple effect evaporation plant upgrade with thermal-mechanical compression of the vapours for Cargill S.r.l. (A. Antonelli).
24. Bentonite mud application in hydraulic tunnel construction: rheological characteristics optimization and environmental impact analysis (E. Di Francesco).
25. Pressure drop modelling and simulation for biphasic flow in refinery pipelines (C. Ranieri).
26. Palladium-based catalyst synthesis development for BASF: process design and reactor modelling (M. Rivelli).
27. Optimization of sugar-based complex molecules separation by chromatography column for Cargill S.r.l. (M. Cramerotti).
28. Analysis of start-up, idle and shut-down of adiabatic and isothermal Sabatier reactors by dynamic simulations (L. Radoviciu).
29. Exergy analysis, equipment sizing and safety analysis of two iron nanoparticles production plants (F. J. Ruida Maillo)-Erasmus.
30. Bentonite mud mixing optimization and liquid/solid separation simulation in PRO/II environment (M. Fellone).
31. Decarbonisation of Steel Production process in ILVA by the use of syngas from MSW and PSW gasification (A. L. Rispoli).
32. Energy and Exergy analysis of a waste-to-energy oxy-combustion plant coupled with H₂ production by PEM electrolyzer and CO₂ capture and utilization for the production of SNG (M. Tomassini).
33. Dynamic simulation of SOEC Electrolyzer and Safety analysis of an incineration-power plant coupled with green hydrogen production (S. Baldasseroni).
34. Decarbonisation of Cement Production process by the use of green hydrogen and bio-oxycombustion processes (V. Mancini).
35. Thermodynamic and kinetic analysis of runaway reactions in Li-ion storage battery: safety and dynamic analysis (D. Di Pasquali).
36. Safety analysis of a surfactant production process in P&G site (P&G collaboration) (S. Galassi)-in progress (October 2021).

Supervisor of Master Engineering Thesis

1. Start-up, shutdown and variable load analysis of methanol production heterogeneous reactors from CO₂ hydrogenation (S. Bucci).
2. Exergoeconomic analysis of Formic Acid process from captured CO₂ hydrogenation coupled with oxy-combustion/incineration of non-recyclable plastic waste (J. Bruni).
3. Dynamic analysis of Ni-Ru catalysed Sabatier process by Aspen Dynamics and 2D dynamic reactor model development in gPROMS environment (C. Corsi)-in progress (July 2021).
4. Kinetic analysis and bioreactor design for the hydrolysis of sucrose in Cargill production plant (Cargill collaboration) (A. Festa).
5. Exergoeconomic analysis of Direct Carbon Fuel Cell for the energy recovery from mixed waste for the green production of H₂: a dynamic study (A. C. Galli)-in progress (July 2021).
6. Biogas upgrading to syngas and green hydrogen from biomass by multiple-reforming and biomass anaerobic digestion-dark fermentation (G. Polce).
7. Economic analysis of two different process layouts for a new slurry line in the BASF site of Rome (BASF collaboration) (F. Carinci).
8. Simulation and economic analysis of the alkaline washing process of a syngas from MSW gasification (S. Mataloni).
9. Valorization of Organic Fraction of Municipal solid Waste by bio-oil production through hydrothermal liquefaction process: process design and environ-exergoeconomic analysis (V. Segneri)-in progress (October 2021).
10. Simultaneous production of bio-fuel and piridine from municipal solid waste and food waste: simulation and environ-exergoeconomic analysis (C. Tizzano).
11. Dynamic modelling of a PEM electrolyzer and techno-economic comparison of hydrogen production from methane reforming and water electrolysis (APS collaboration) (D. Paladino)-in progress (January 2022).
12. Simulation and upgrading to green route of a tunable continuous plant for the production of two pharmaceutical compounds (L. Morfuni)-in progress (January 2022).
13. Technical-Economic analysis of the steel production sector decarbonisation by hydrogen use (A. Trinca).

14. Exergo-economic analysis of super-critical CO₂ re-utilization for the coupled production of acetylsalicylic acid and ethanol from fermentation by-products extracted bio-phenols (A. De Lucia).
15. Syngas cleaning and upgrading process analysis and optimization for the production of bio-hydrogen and carbon monoxide as reducing gases in Taranto industrial site (A. Conte).

AIDIC activities

Organization of the following industrial plant visits for Chemical Engineering Students:

Procter & Gamble, Pomezia (Roma).

Enea, Centro Ricerche Casaccia, Roma.

Raffineria ENI, Livorno.

Cargill, Castelmassa (Rovigo).

OMC 2019, Ravenna.

Ecotherm, Pomezia (Roma).

BASF, Roma.

BASF, Bologna.

Solvay Specialty Polymers, Spinetta Marengo (Alessandria).

Colgate-Palmolive, Anzio (Roma).

Organization of Contest and Cultural Exchange Programs:

Student AIDIC 2018 Award.

Chem-Eng Brazilian Exchange.

Student AIDIC 2019 Award.

Reviewer

Chemical Engineering Journal, Journal of Cleaner Production, Chemosphere, Journal of Hazardous Materials (see Publons: <https://publons.com/researcher/1545252/giorgio-vilardi/>).

Scientific Articles (Scopus indexed)

1. Di Palma L., Medici F., **Vilardi G.**, 2015, *Artificial Aggregate From non Metallic Automotive Shredder Residue*, Chemical Engineering Transaction, 43, 1723-1728.
2. Muradova G. G., Gadjieva S. R., Di Palma L. **Vilardi G.**, 2016, *Nitrates removal by bimetallic Nanoparticles in water*, Chemical Engineering Transaction, 47, 205-210.
3. Gueye M. T., Di Palma L., Allahverdeyeva G., Bavasso I., Petrucci E., Stoller M., **Vilardi G.**, 2016, *The influence of heavy metals and organic matter on hexavalent chromium reduction by nano zero valent iron in soil*, Chemical Engineering Transaction, 47, 289-294.
4. Bavasso I., **Vilardi G.**, Stoller M., Chianese A., Di Palma L., 2016, *Perspectives in nanotechnology based innovative applications for the environment*, Chemical Engineering Transaction, 47, 55-60.
5. Stoller M., Azizova G., Mammadova A., **Vilardi G.**, Di Palma L., Chianese A., 2016, *Treatment of olive oil processing wastewater by ultrafiltration, nanofiltration, reverse osmosis and biofiltration*, Chemical Engineering Transaction, 47, 409-414.
6. **Vilardi G.**, Di Palma, L., 2017, *Kinetic Study of Nitrate Removal from Aqueous Solutions Using Copper-Coated Iron Nanoparticles*, Bulletin of Environmental Contamination and Toxicology, 98(3): 359-365.
7. **Vilardi G.**, Verdone N. and Di Palma L., 2017, *The influence of nitrate on the reduction of hexavalent chromium by Zero Valent Iron nanoparticles in polluted wastewater*. Desalination and Water treatment. 86, 252-258.
8. **Vilardi G.**, Stoller M., Di Palma L., Verdone N., 2017, *Production of nano Zero Valent Iron Particles by means of a spinning disk reactor*. Chemical Engineering Transactions, 57, 751-756.
9. Stoller M., Ochando-Pulido J.M., **Vilardi G.**, Vuppala, Bravi M., Verdone N., Di Palma L., 2017, *Technical and Economic Impact of Photocatalysis as a Pretreatment Process Step in Olive Mill Wastewater Treatment by Membranes*. Chemical Engineering Transactions, 57, 1171-1176.
10. **Vilardi G.**, Di Palma L., Verdone N., 2017, *Competitive Reaction Modelling in Aqueous Systems: the Case of Contemporary Reduction of Dichromates and Nitrates by nZVI*. Chemical Engineering Transactions, 60, 175-180.
11. Stoller M., **Vilardi G.**, Di Palma L., Chianese A., Morganti P., *Process intensification techniques for the production of nanoparticles for the cosmetic and pharmaceutical industry*, 2017, Journal of Applied Cosmetology, 35, 53-59.
12. **Vilardi G.**, Di Palma L., Verdone N., *Heavy metals adsorption by banana peels micro-powder. Equilibrium modeling by non-linear models*, Chinese Journal of Chemical Engineering, 2018, 26, 455-464.
13. **Vilardi G.**, Sebastiani, D., Miliziano, S., Verdone, N., Di Palma, L., 2018. *Heterogeneous nZVI-induced Fenton oxidation process to enhance biodegradability of excavation by-products*, Chemical Engineering Journal, 335, 309-320.
14. **Vilardi G.**, Di Palma, L., Verdone, N., *On the critical use of zero valent iron nanoparticles and Fenton processes for the treatment of tannery wastewater*, 2018, Journal of Water Process Engineering, 22, 109, 122.
15. Stoller, M., Di Palma, L., Vuppala, S., Verdone, N., **Vilardi G.**, *Process intensification techniques for the production of nano- and submicronic particles for food and medical applications*, 2018, Current Pharmaceutical Design, 24 (21), pp. 2329-2338.

16. Chinh, V.D., Broggi, A., Di Palma, L., Scarsella, M., Speranza, G., **Vilardi, G.**, Thang, P.N., *XPS Spectra Analysis of Ti²⁺, Ti³⁺ Ions and Dye Photodegradation Evaluation of Titania-Silica Mixed Oxide Nanoparticles*, 2018, Journal of Electronic Materials, 47, 2215-2224.
17. **Vilardi, G.**, Mpouras T., Dermatas D., Verdone N., Polydera A., Di Palma L., *Nano-Materials application for heavy metals recovery from polluted water: The combination of nano zero-valent iron and carbon nanotubes. Competitive adsorption non-linear modeling*, 2018, Chemosphere, 201, 716-729.
18. **Vilardi, G.**, Ochando-Pulido, J.M., Stoller, M., Verdone, N., Di Palma, L., *Fenton oxidation and chromium recovery from tannery wastewater by means of iron-based coated biomass as heterogeneous catalyst in fixed-bed columns*, 2018, Chemical Engineering Journal, 351, 1-11.
19. **Vilardi, G.**, Ochando-Pulido, J.M., Verdone, N., Stoller, M., Di Palma, L., *On the removal of hexavalent chromium by olive stones coated by iron-based nanoparticles: Equilibrium study and chromium recovery*, 2018, Journal of Cleaner Production, 190, 200-210.
20. **Vilardi, G.**, Rodríguez-Rodríguez, J., Ochando-Pulido, J.M., Verdone, N., Martínez-Ferez, A., Di Palma, L., *Large Laboratory-Plant application for the treatment of a Tannery wastewater by Fenton oxidation: Fe(II) and nZVI catalysts comparison and kinetic modelling*, 2018, Process Safety and Environmental Protection, 117, 629-638.
21. Chinh, V.D., Hung, L.X., Di Palma, L., Hanh, V.T.H., **Vilardi, G.** *Effect of Carbon Nanotubes and Carbon Nanotubes/Gold Nanoparticles Composite on the Photocatalytic Activity of TiO₂ and TiO₂-SiO₂*, 2018, Chemical Engineering and Technology. Article in Press.
22. **Vilardi, G.** *Bimetallic nZVI-induced chemical denitrification modelling using the shrinking core model*, 2018, Chemical Engineering Transactions, 70, pp. 235-240.
23. Stoller, M., Sacco, O., **Vilardi, G.**, Pulido, J.M.O., Di Palma, L. *Technical-economic evaluation of chromium recovery from tannery wastewater streams by means of membrane processes*, 2018, Desalination and Water Treatment, 127, pp. 57-63.
24. Di Palma, L., Verdone, N., **Vilardi, G.** *Kinetic Modeling of Cr(VI) Reduction by nZVI in Soil: The Influence of Organic Matter and Manganese Oxide*, 2018, Bulletin of Environmental Contamination and Toxicology, 101 (6), pp. 692-697.
25. Coppola, L., Bellezze, T., Belli, ..., **Vilardi, G.**, Yang, F. *Binders alternative to Portland cement and waste management for sustainable construction—part 1*, 2018 Journal of Applied Biomaterials and Functional Materials, 16 (3), pp. 186-202.
26. Coppola, L., Bellezze, T., Belli, ..., **Vilardi, G.**, Yang, F. *Binders alternative to Portland cement and waste management for sustainable construction – Part 2*, 2018 Journal of Applied Biomaterials and Functional Materials, 16 (4), pp. 207-221.
27. **Vilardi, G.** *Mathematical modelling of simultaneous nitrate and dissolved oxygen reduction by Cu-nZVI using a bi-component shrinking core model*, 2019, Powder Technology, 343, pp. 613-618.
28. **Vilardi, G.**, Rodríguez-Rodríguez, J., Miguel Ochando-Pulido, J., Di Palma, L., Verdone, N. *Fixed-bed reactor scale-up and modelling for Cr(VI) removal using nano iron-based coated biomass as packing material*, 2019, Chemical Engineering Journal, 361, pp. 990-998.
29. **Vilardi, G.**, Di Palma, L., Verdone, N. *A physical-based interpretation of mechanism and kinetics of Cr(VI) reduction in aqueous solution by zero-valent iron nanoparticles*, 2019, Chemosphere, 220, pp. 590-599.

30. **Vilardi, G.**, Parisi, M., Verdone, N. *Simultaneous aggregation and oxidation of nZVI in Rushton equipped agitated vessel: Experimental and modelling*, 2019, Powder Technology, 353, pp. 238-246.
31. Sebastiani, D., **Vilardi, G.**, Bavasso, I., Di Palma, L., Miliziano, S. *Classification of foam and foaming products for EPB mechanized tunnelling based on half-life time*, 2019, *Tunnelling and Underground Space Technology*, 92, art. no. 103044.
32. Vuppala, S., Bavasso, I., Stoller, M., Di Palma, L., **Vilardi, G.** *Olive mill wastewater integrated purification through pre-treatments using coagulants and biological methods: Experimental, modelling and scale-up*, 2019, Journal of Cleaner Production, 236, art. no. 117622.
33. **Vilardi, G.**, Stoller, M., Di Palma, L., Verdone, N. *CFD model of agitated vessel for the removal of Cr(VI) by nano-hematite particles*, 2019, Chemical Engineering Transactions, 73, pp. 157-162.
34. **Vilardi, G.**, Stoller, M., Di Palma, L., Boodhoo, K., Verdone, N. *Metallic iron nanoparticles intensified production by Spinning Disk Reactor: optimization and fluid dynamics modelling*, 2019, Chemical Engineering and Processing-Process Intensification, 146, art. no. 107683.
35. **Vilardi, G.**, Bubbico, R., Di Palma, L., Verdone, N. *Nitrate green removal by fixed-bed columns packed with waste biomass: Modelling and friction parameter estimation*, 2020, Chemical Engineering Research and Design, 154, pp. 250-261.
36. Brasili, E., Bavasso, I., Petrucci, V., **Vilardi, G.**, Valletta, A., Dal Bosco, C., Gentili, A., Pasqua, G., Di Palma, L. (2020). *Remediation of hexavalent chromium contaminated water through zero-valent iron nanoparticles and effects on tomato plant growth performance*. Nature Scientific Reports, 10(1), 1-11.
37. **Vilardi, G.**, De Caprariis, B., Stoller, M., Di Palma, L., Verdone, N. *Intensified water denitrification by means of a spinning disk reactor and stirred tank in series: Kinetic modelling and computational fluid dynamics*, 2020, *Journal of Water Process Engineering*, 34, art. no. 101147.
38. Bassano, C., Deiana, P., **Vilardi, G.**, Verdone, N. *Modeling and economic evaluation of carbon capture and storage technologies integrated into synthetic natural gas and power-to-gas plants*, 2020, Applied Energy, 263, art. no. 114590.
39. **Vilardi, G.**, Verdone, N. *Production of metallic iron nanoparticles in a baffled stirred tank reactor: Optimization via computational fluid dynamics simulation*, 2020, Particuology, 52, pp. 83-96.
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Patent B.

Other interests

Swimming, boxe, Greco-Roman wrestling, private teaching, rock and classic music and voluntary activities.

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Rome, 22/06/2021