

**CURRICULUM VITAE**

**Dr. STYLIANOS I. SFAKIOTAKIS**

Chemical Engineer, MSc, PhD

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**WORK ADDRESS**

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**EDUCATION****Doctor of Philosophy (PhD)**

Technical University of Crete, Greece

School of Mineral Resources Engineering

Dissertation: *Study for the valorization of solid agricultural, municipal and industrial wastes of Crete for energy production- Thermal and kinetic analyses*

**Master of Science (MSc)**

Technical University of Crete, Greece

Department of Environmental Engineering

Dissertation: *Modeling of leachate transport from Amari of Rethymno landfill in the aquifer*

**Diploma (BSc) in Chemical Engineering**

National Technical University of Athens, Greece

Department of Chemical Engineering

Dissertation: *Historical and philosophical consideration of views upon science of matter aspects*

**SCHOLARSHIPS**

Scholarship for the Postgraduate Program “Quality control and Environmental Management”, Department of Environmental Engineering, Technical University of Crete

## **PROFESSIONAL EXPERIENCE**

- Laboratory Teaching Staff, School of Mineral Resources Engineering, Technical University of Crete, *2017-Today*
- Specialized Technical and Laboratory Staff, School of Mineral Resources Engineering, Technical University of Crete, *2014-2017*
- Research and Laboratory Associate at the Solid Fuels Beneficiation and Technology Laboratory with a contract of indefinite duration, Department of Mineral Resources Engineering, Technical University of Crete, *2006 – 2014*
- Research and Laboratory Associate at the PVT and Core Analysis Laboratory, Department of Mineral Resources Engineering, Technical University of Crete, (P.D.407/80 and Project contracts, *2002-2005*)

## **TEACHING AND EDUCATIONAL EXPERIENCE**

- Postgraduate course: Biomass, Bioenergy and the Environment, (co-teaching with Prof. Vamvuka), *2019-Today*
- Postgraduate course: Environmental Control in Energy Production, (co-teaching with Prof. Vamvuka), *2019-Today*
- Laboratory exercises for the courses: Coal Beneficiation, Technology of Solid Fuels Valorization, School of Mineral Resources Engineering, Technical University of Crete, *2006-Today*
- Laboratory exercises for the courses: Physics 1 (Mechanics, Thermodynamics), Health and Safety in the Mineral Industry (1 exercise entitled “Gas and vapour sampling using the IHVL software”), School of Mineral Resources Engineering, Technical University of Crete, *2014-Today*
- Laboratory exercises for the courses: Reservoir Engineering, Physicochemical Characterization of Energy Resources, Reservoir Exploitation, Design of Physical Processes, Department of Mineral Resources Engineering, Technical University of Crete, *2002-2005*
- Laboratory exercises for the course: Transport Phenomena, Department of Natural Resources and Environment, Technological Educational Institute of Crete, *2003-2004*
- Support/tutoring for more than 30 undergraduate and postgraduate theses, member of the examining committee at 7 theses, *2006- Today*

## **PARTICIPATION IN PROJECTS**

- Participation (main researcher at one workpackage) in the project “Chemical Composition and Microstructure Analysis of Carbon Dioxide Absorbents”
- Participation in the project “Prototype Unit for Biomass Combustion”
- Participation in the project “Energy from Peaches”
- Participation (main researcher at one workpackage) in the EU project “MOREOIL” (Evaluation of the Miscible Gas Injection in Oil Reservoirs by Monitoring the Asphaltenes Concentration)
- Participation in the project of laboratory evaluation of drilling fluids in the Epsilon 1AS of “Prinos” reservoir (Funding: KAVALA OIL)

## **SPECIAL LABORATORY EXPERIENCE**

- Apparatus and equipment setup for the study of solid fuels pyrolysis, gasification and combustion processes (thermogravimetric analyzer, calorimeter, mass spectrometer, TG/MS coupling, fixed and fluidized bed reactors, biomass boiler, gas analyzers, etc).
- Apparatus and equipment setup for the thermodynamic study of petroleum mixtures under high pressure (PVT system, slim tube, piston and mercury pumps, pressure and temperature transducers, high pressure vessels and fittings, etc).

## **ALGORITHMS DEVELOPMENT AND SPECIAL SOFTWARE KNOWLEDGE**

- Development of a mathematical model for biomass pyrolysis and combustion kinetics (MATLAB Environment)
- NETZSCH Kinetics: Reaction kinetics
- IHVL: Simulation of a (virtual) laboratory for the evaluation and control of workplace hazards
- STATGRAPHICS: Statistical software (comparison of samples, multivariate analysis, design of experiments and optimization, etc.)
- MATLAB NNTOOL: Neural Net fitting
- Development of a mathematical model for the prediction of vapor-liquid-solid (VLS) equilibrium in petroleum mixtures (Matlab Environment)
- CMG WinProp: VLS equilibrium in petroleum
- PTC, ArgusOne: Modeling of chemical transport by 3D groundwater flows

## SUMMARY OF CURRENT SCIENTIFIC INTERESTS

- Thermochemical processes (pyrolysis, combustion, gasification) for fossil and non-fossil fuels valorization
- Physicochemical characterization of energy sources and thermal analyses methods (TG/DTG, DTA, TG/MS, etc)
- Kinetic modeling of thermochemical processes
- Ash and biochar characterization and studies

## PUBLICATIONS

### *A/ INTERNATIONAL SCIENTIFIC JOURNALS (PEER-REVIEWED)*

1. Vamvuka D., Afthentopoulos E., **Sfakiotakis S.**, H<sub>2</sub>-rich gas production from steam gasification of a winery waste and its blends with industrial wastes. Effect of operating parameters on gas quality and efficiency, *Renewable Energy* 197, 1224-1232, (2022)
2. Vamvuka D., Teftiki A., **Sfakiotakis S.**, Investigating the Valorisation of Refused Derived Fuel for Energetic Uses Through Its Co-Gasification with Woody Wastes, *World* 11, 1, 37-44, (2022)
3. Vamvuka D., Diamantaki M., **Sfakiotakis S.**, Combustion performance and kinetic modeling of lignite blended with torrefied biomass of different origin, *International Journal of Green Energy*, DOI: 10.1080/15435075.2021.1987914, (2021)
4. Vamvuka D., Teftiki A., **Sfakiotakis S.**, Increasing the reactivity of waste biochars during their co-gasification with carbon dioxide using catalysts and bio-oils, *Thermochimica Acta* 704, 179015, (2021)
5. Vamvuka D., Panagopoulos G., **Sfakiotakis S.**, Investigating potential co-firing of corn cobs with lignite for energy production. Thermal analysis and behavior of ashes, *International Journal of Coal Preparation and Utilization*, 1-12, Published online: 12 Dec 2020, DOI: 10.1080/19392699.2020.1856099
6. Vamvuka D., Machairas E., **Sfakiotakis S.**, Pantelaki O., Physically Activated Agricultural Waste Biochars for Production of Pollutant Adsorbents, *Journal of Chemical Engineering research Updates*, 7, 6-15, (2020)

7. Vamvuka D., Loukakou E., **Sfakiotakis S.**, Petrakis E., The impact of a combined pre-treatment on the combustion performance of various biomass wastes and their blends with lignite, *Thermochimica Acta*, 688, 178599, (2020)
8. Vamvuka, Loukeris D., Stamou E., Vlasiadis A., **Sfakiotakis S.**, Bandelis G., Development and Performance of a Multi-Fuel Residential Boiler Burning Agricultural Residues, *Frontiers in Energy Research* 8, 136, (2020)
9. Vamvuka D., Loukakou E., Avgoustidis C., Stratakis A., Pavloudakis F., **Sfakiotakis S.**, Co-combustion characteristics of lignite/woody biomass blends. Reactivity and fusibility assessment, *Energy Sources, Part A*, 1-15, Published online: 17 Sep 2019, DOI: 10.1080/15567036.2019.1668885
10. Vamvuka D., **Sfakiotakis S.**, Thermal Behaviour and Reactivity of Swine Sludge and Olive By-Products During Co-pyrolysis and Co-combustion, *Waste and Biomass Valorization* 10 (5), 1433-1442, (2019)
11. Vamvuka D., **Sfakiotakis S.**, Pantelaki O., Evaluation of gaseous and solid products from the pyrolysis of waste biomass blends for energetic and environmental applications, *Fuel* 236, 574-582, (2019)
12. Vamvuka D., **Sfakiotakis S.**, Mpoumpouris A., Slagging and Fouling Propensities of Ashes from Urban and Industrial Wastes, *Recent Innovations in Chemical Engineering*, 11, 145-148, (2018)
13. **Sfakiotakis S.**, Vamvuka D., Study of co-pyrolysis of olive kernel with waste biomass using TGA/DTG/MS, *Thermochimica Acta*, 670, 44-54, (2018)
14. Vamvuka D., Dermitzakis S., Pentari D., **Sfakiotakis S.**, Valorization of Meat and Bone Meal through Pyrolysis for Soil Amendment or Lead Adsorption from Wastewaters, *Food and Bioproducts Processing*, 109, 148-157, (2018)
15. **Sfakiotakis S.**, Vamvuka D., Thermal Decomposition Behavior, Characterization and Evaluation of Pyrolysis Products of Agricultural Wastes, *Journal of the Energy Institute*, 91, 951-961, (2018)
16. Vamvuka D., **Sfakiotakis S.**, Mpoumpouris A., Slagging and Fouling Propensities of Ashes from Urban and Industrial Wastes, *Recent Innovations in Chemical Engineering*, 11,2, (2018)
17. Vamvuka D., **Sfakiotakis S.**, Thermal Behaviour and Reactivity of Swine Sludge and Olive By-Products during Co-pyrolysis and Co-combustion, *Waste Biomass Valorization* <https://doi.org/10.1007/s12649-017-0118-4>, (2017)

18. Vamvuka D., Papas M., Galetakis M., **Sfakiotakis S.**, Thermal Valorization of an Animal Sludge for Energy Recovery, via Co-combustion with Olive Kernel in a Fluidized Bed Unit. Optimization of Emissions, *Energy Fuels*, 30, (7), 5825–5834, (2016)
19. **Sfakiotakis S.**, Vamvuka D., Development of a modified independent parallel reactions kinetic model and comparison with the distributed activation energy model for the pyrolysis of a wide variety of biomass fuels, *Bioresource Technology* 197, 434-442, (2015)
20. Vamvuka D., **Sfakiotakis S.**, Saxioni S., Evaluation of urban wastes as promising co-fuels for energy production- A TG/MS study, *Fuel*, 147, 17, 170-183, (2015)
21. Vamvuka D., **Sfakiotakis S.**, Pazara E., Panopoulos K., Kinetic modeling of five sustainable energy crops as potential sources of bioenergy, *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects*, 38, 12, 1812-1818, (2016)
22. Manara P., Vamvuka D., **Sfakiotakis S.**, Vanderghem C., Richel A., Zabaniotou A., Mediterranean agri-food processing wastes pyrolysis after pre-treatment and recovery of precursor materials: A TGA-based kinetic modeling study, *Food Research International*, 73, 44–51, (2015)
23. Vamvuka D., **Sfakiotakis S.**, Gasification reactivity and mass spectrometric analysis of gases of energy crop chars under a CO<sub>2</sub> atmosphere, *Energy and Fuels*, 29, 5, 3215-3223, (2015)
24. Vamvuka D., **Sfakiotakis S.**, Panopoulos D., An experimental study on the thermal valorization of municipal and animal wastes, *Int. Journal of Energy & Environment*, 4, 191-198, (2013)
25. Karampinis E., Vamvuka D., **Sfakiotakis S.**, Grammelis P., Itskos G., Kakaras E., Comparative study of combustion properties of five energy crops and Greek lignite, *Energy and Fuels*, 869-878, 26, 2, (2012)
26. Vamvuka D., Karouki E., **Sfakiotakis S.**, Salatino P., Gasification of waste biomass chars by carbon dioxide via thermogravimetry-Effect of catalysts, *Combustion Science and Technology*, 184, 64-77, (2012)
27. Vamvuka D., **Sfakiotakis S.**, Effects of heating rate and water leaching of perennial energy crops on pyrolysis characteristics and kinetics, *Renewable Energy*, 36, 2433-2439, (2011)
28. Damartzis Th., Vamvuka D., **Sfakiotakis S.**, Zabaniotou A., Thermal degradation studies and kinetic modeling of cardoon (*Cynara cardunculus*) pyrolysis using thermogravimetric analysis”, *Bioresource Technology*, 102, 6230-6238, (2011)

29. Vamvuka D., Karouki E., **Sfakiotakis S.**, Gasification of waste biomass chars by carbon dioxide via thermogravimetry, Part I: Effect of mineral matter, *Fuel*, 90 1120–1127, (2011)
30. Vamvuka D., Topouzi V., **Sfakiotakis S.**, Evaluation of production yield and thermal processing of switchgrass as a bioenergy crop for the Mediterranean region, *Fuel Processing Technology*, 91, 988-996, (2010)
31. Vamvuka D., Salpigidou N., Kastanaki E., **Sfakiotakis S.**, Possibility of using paper sludge in co-firing applications, *Fuel*, 88,(4), 637-643, (2009)
32. Vamvuka D., **Sfakiotakis S.**, Kotronakis M., Fluidized bed combustion of residues from oranges' plantations and processing, *Renewable Energy*, 44, 231-237, (2012)
33. Vamvuka D., **Sfakiotakis S.**, Mourouzidis T., Bandelis G., Development of a biomass-fired combustion unit for residential heating, *Combustion Science and Technology*, 183, 764-778, (2011)
34. Vamvuka D., **Sfakiotakis S.**, Combustion behaviour of biomass fuels and their blends with lignite”, *Thermochimica Acta*, 526, 192-199, (2011)

#### ***B/ CONFERENCE PROCEEDINGS WITH REVIEWERS***

35. Vamvuka D., Esser K., **Sfakiotakis S.**, “A parametric study on the co-combustion of agricultural waste chips in a residential boiler”, *Proceedings Conference Goldschmidt 2021, Lyon*, (2021).
36. **Sfakiotakis S.**, Vamvuka D., “Evaluation of properties of biochars produced from pyrolysis of urban wastes for agricultural applications”, *Proceedings of the 7th Int. Conference on Hazardous and Industrial Waste Management, Chania-Crete*, (2021)
37. **Sfakiotakis S.**, Vamvuka D., Kosmadaki M., “Combustion characteristics and thermal behaviour of agricultural/urban waste blends as potential feedstocks for energy production”, *Proceedings of the 6th Int. Conference on Hazardous and Industrial Waste Management, Chania - Crete, September ( 2018)*
38. Vamvuka D., **Sfakiotakis S.**, Spyridakis S., Panopoulos K., Skevis G., “Thermal behaviour and properties of pyrolysis and combustion products of an industrial swine waste”, *Proceedings of the 8th European Combustion Meeting, Dubrovnik, Croatia, April* (2017)



39. Tsekos Chr., Vamvuka D., **Sfakiotakis S.**, Mihailof Chr., Lemonidou A., Panopoulos K., Pentari D., Kinetic Modeling for the Pyrolysis of Biomass Fuels derived from Oil Crops, *Proceedings of the 7th European Combustion Meeting, Budapest, Hungary, April, 1-4. P1-57, (2015)*
40. Vamvuka D., Chatib N.El., **Sfakiotakis S.**, “Measurements of ignition point and combustion characteristics of biomass fuels and their blends with lignite”, *Proceedings of the 5th European Combustion Meeting, 1-6, London, England, 28-30 June, (2011)*
41. Vamvuka D., **Sfakiotakis S.**, Alevizos G., Galetakis M., Evaluating olive tree prunings as a secondary fuel in fluidized bed combustion-Emissions and ash effects, *International Nordic Bioenergy Conference, 227-234, Finland, 5-9 September, (2011)*
42. Vamvuka D., **Sfakiotakis S.**, Ash disposal impacts from co-firing lignite and agricultural prunings in Crete, *Proceedings of the International Symposium on Green Chemistry for Environment and Health, Mykonos, 1-6, 27-29 September, (2010)*
43. Vamvuka D., Topouzi V., **Sfakiotakis S.**, Pentari D., Christou M., Production yield and combustion characteristics of Cardoon grown as a potential feedstock for energy applications in Greece, *Proceedings of the 17th European Biomass Conference and Exhibition, 1269-1272, Hamburg, 29 June - 3 July, (2009)*
44. Kalpakas Th, Vamvuka D., Bandelis G., **Sfakiotakis S.**, Mourouzidis Th., An innovative combustion unit for the energy exploitation of agricultural wastes in Greece”, *Proceedings of the 12th Conference on Environment and Mineral Processing and Exhibition, 225-231, Ostrava, 26-28 June, (2008)*
45. **Sfakiotakis S.**, Pasadakis N., Varotsis N., Hjermsstad H.P., Qualitative and quantitative study of asphaltene precipitation during a gas injection project, *13<sup>th</sup> European Symposium on IOR- EAGE, Budapest, Hungary, 25-27 April, (2005)*
46. **Sfakiotakis S.**, Brouzos C., Varotsis N., An EoS based mathematical model for the prediction of asphaltene precipitation, *5<sup>th</sup> Panhellenic Congress of Chemical Engineering, Tziolas Publications, 1121-1124, Thessaloniki, 26-28 May,(2005)*
47. **Sfakiotakis S.**, Pasadakis N., Varotsis N., Study of asphaltene thermodynamic behavior in reservoirs under high pressure, *4<sup>th</sup> Panhellenic Congress of Chemical Engineering, Tziolas Publications, 517-520, Patras, 29-31 May, (2003)*

#### **C/ CITATIONS, H-INDEX, i10-INDEX**

**Citations:** 1476 (Google Scholar, September 2022)

**H-index:** 17, **i10-index:** 25 (Google Scholar, September 2022)

#### ***D/ REVIEWER FOR JOURNALS***

Reviewer for **16** international scientific journals (peer-review): “Biomass Conversion and Biorefinery”, “Chemosphere”, “Energy and Fuels”, “Energies”, “Energy Conversion and Management”, “Fuel”, “Industrial Crops and Products”, “International Journal of Environmental Science and Technology”, “Journal of Analytical and Applied Pyrolysis”, “Journal of Hazardous Materials”, “Renewable Energy”, “Scientific Reports-Nature”, “Sustainable Energy Technologies and Assessments”, “Thermal Science and Engineering Progress”, “Thermochimica Acta”, “Waste Management”.

#### **LANGUAGES**

English: Proficiency Level

#### **ADMINISTRATIVE POSITIONS**

Member (alternate) of the Senate of the Technical University of Crete (2019-2021)

Member of the administrative board of the Technical University of Crete Laboratory Teaching Staff Association, (2018-2020)

Member of the administrative board of the Technical University of Crete Specialized Technical Laboratory Staff Association: Chairman (2015- 2017), Vice Chairman (2014-2015)

Member of the General Assembly of the Mineral Resources Engineering Department, (2015-2017)

Member of the Technical Chamber of Greece (2002-Today)