

# José Aniceto



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## PROFILE

Chemical Engineer and Post-Doc Researcher at CICECO with 9 years research experience and 14 publications.

- Specialized in separation processes, namely adsorption and supercritical fluid extraction.
- Experience in the synthesis of functional materials for the selective separation of bioactive compounds.
- Robust programming skills for modeling, optimization, statistical analysis and machine learning.
- Passionate about technology, problem solving and research.
- Looking to apply my research background to industry challenges and new products.

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## EDUCATION

### PhD in Chemical Engineering

Feb. 2013 - Jan. 2018

University of Aveiro

- PhD thesis on the "Separation of triterpenic acids by simulated moving bed chromatography" supervised by Professor Carlos Manuel Silva.

### Master in Chemical Engineering

Sep. 2005 - Jul. 2010

Faculty of Engineering University of Porto (FEUP)

- Master thesis on the "Optimization of adsorption air dryer units using design of experiments techniques" supervised by Professor Adélio Mendes and developed at Sysadvance – Sistemas de Engenharia S.A.

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## PROFESSIONAL EXPERIENCE

### Post-Doc Researcher, Amorim Cork Project

Jul. 2020 - present

CICECO, University of Aveiro

- Working on the removal of TCA (main responsible for the cork taint in wine) from cork by supercritical fluid extraction.
- Providing scientific support in the procurement and setup of a major supercritical extraction unit at Amorim Cork, and in writing an European Patent on this innovative process.

### Post-Doc Researcher, Multibiorefinery Project

Mar. 2018 - Jun. 2020

CICECO, University of Aveiro

- Worked on the extraction of valuable compounds from agroforestry and food industry by-products using supercritical fluid extraction.
- Developing Artificial Intelligence models for the prediction of diffusion coefficients in liquid and supercritical systems.

### PhD Student

Feb. 2013 - Jan. 2018

CICECO, University of Aveiro

- Worked on the separation and purification of bioactive compounds by simulated moving bed (SMB) chromatography.
- Synthesized functional polymers to selectively separated bioactive compounds.
- Designed and assembled a laboratory scale SMB chromatography unit.
- Developed a SMB simulator program in MATLAB capable of predicting the separation performance.
- Proposed a new optimization strategy for SMB processes based in statistical analysis.

### Research Fellow

Dec. 2010 - Jan. 2013

CICECO, University of Aveiro

- Worked on the modeling of ion exchange equilibrium, mainly in the scope of water treatment.
- Developed a model to predict activity coefficients in ion exchange systems using Artificial Neural Networks.
- Worked on the development of a biomass-based polyol production process.

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## FURTHER EXPERIENCE

### Consulting services for Amorim Cork

Apr 2019 - May 2020

- Provided scientific support for the development of a new technology and the design/commissioning of the prototype and industrial unit.
- Filing an European Patent on the new technology developed.
- Writing and submitting a national project grant proposal.

### Consulting services for Novarroz

Sep-Dec 2019

- Worked to solve problems related with improper storage of rice grains and optimized ventilation strategies.
- Developed a program to assist operators in setting proper ventilation in rice silos given ambient temperature and humidity conditions.

### Supervising and mentoring

2017-2019

- Supervision of 3 Master Theses projects of the Integrated Master in Chemical Engineering at University of Aveiro.

### Organization of an international scientific conference

2-4 Oct. 2018

13th International Chemical and Biological Engineering Conference (CHEMPOR 2018)

- CHEMPOR 2018 is an international scientific conference in the fields of Chemical and Biological Engineering which, in 2018, was organized by the University of Aveiro and Ordem dos Engenheiros.
- I was a member of a five person team responsible for the organization of the conference.

### Collaboration in teaching activities

2015 - 2016

Course: Engenharia Avançada das Reações Químicas (5th year, MIEQ, UA)

University of Aveiro

- Collaboration and assistance on the classes, which cover advanced modeling of chemical reactions using numerical methods and MATLAB.

### Management of Research Laboratory

2015 - present

EgiChem Lab, CICECO, University of Aveiro

- Management of the EgiChem Laboratory coordinated by Professor Carlos Silva.
- Responsible for the maintenance and safety operation of the laboratory and coordination of its members.

### Web design and development

- Created my research group website ([www.egichem.com](http://www.egichem.com)), composed by a public section and a private area that provides inventory and lab management tools.
- Created my personal website ([joseaniceto.com](http://joseaniceto.com)) as well as several other projects, which include a programming blog and an open-source chromatographic modeling suite.

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## SKILLS

<b>Languages</b>	Portuguese (Native), English (Proficient - C2), French (Basic - A2).
<b>Laboratory</b>	Over 8 years experience in laboratory work. Experience with chromatographic processes, cyclic adsorption processes, and analytical/characterization techniques such as HPLC and spectroscopy.
<b>Programming</b>	Robust programming experience in MATLAB and Python. Experience with SQL databases, VBA (for Excel) and LaTeX typesetting.
<b>Modeling</b>	Large experience in the modeling and simulation of several processes using both phenomenological and Artificial Intelligence models, as well as application of chemical process simulator Aspen Plus.
<b>Optimization</b>	Experience in the optimization of engineering processes by applying numerical optimization algorithms and statistical analysis tools such as Design of Experiments and Response Surface Methodologies (including software Design Expert, Statistica and JMP).

<b>Software</b>	Statistical software SPSS, Microsoft Office applications (Word, Excel, Power Point, Access, Project, Visio), vector design with Inkscape, Windows and Linux operating systems.
<b>Web</b>	Back-end using Python Django and Flask. Front-end with Javascript, React, HTML/CSS.

## PUBLICATIONS

### ARTICLES

**Enhanced separation of bioactive triterpenic acids with a triacontylsilyl silica gel adsorbent: from impulse and breakthrough experiments to the design of a simulated moving bed unit**

IS Azenha, [JPS Aniceto](#), CA Santos, A Mendes, CM Silva, Separation and Purification Technology, 2020, 248 116991.

**Chromatographic separation of betulinic and oleanolic acids**

IS Azenha, [JPS Aniceto](#), SP Sequeira, A Mendes, CM Silva, Separation and Purification Technology, 2020, 235 116129.

**Design and optimization of a simulated moving bed unit for the separation of betulinic, oleanolic and ursolic acids mixtures: experimental and modeling studies**

[JPS Aniceto](#), IS Azenha, FMJ Domingues, A Mendes, CM Silva, Separation and Purification Technology, 2018, 192 401-411.

**General optimization strategy of simulated moving bed units through design of experiments and response surface methodologies**

[JPS Aniceto](#), SP Cardoso, CM Silva, Computers & Chemical Engineering, 2016, 90 161-170.

**Simulated Moving Bed strategies and designs: From established systems to the latest developments**

[JPS Aniceto](#), CM Silva, Separation and Purification Reviews, 2015, 44(1) 41-73.

**Maxwell-Stefan based modelling of ion exchange systems containing common species ( $\text{Cd}^{2+}$ ,  $\text{Na}^+$ ) and distinct sorbents (ETS-4, ETS-10)**

PF Lito, [JPS Aniceto](#), CM Silva, International Journal of Environmental Science and Technology, 2015, 12(1) 183-192.

**Modelling ion exchange kinetics in zeolyte-type materials using Maxwell-Stefan approach**

PF Lito, [JPS Aniceto](#), CM Silva, Desalination and Water Treatment, 2013, 52(28-30) 5333-5342.

**Modeling ion exchange equilibrium of ternary systems using neural networks**

[JPS Aniceto](#), DLA Fernandes, CM Silva, Desalination, 2013, 309 267-274.

**Removal of anionic pollutants from waters and wastewaters and materials perspective for their selective sorption**

PF Lito, [JPS Aniceto](#), CM Silva, Water, Air, & Soil Pollution, 2012, 223(9) 6133-6155.

**Biomass-based polyols through oxypropylation reaction**

[JPS Aniceto](#), I Portugal, CM Silva, Chemsuschem, 2012, 5(8) 1358-1368.

**Modeling sorbent phase nonideality for the accurate prediction of multicomponent ion exchange equilibrium with the homogeneous mass action law**

[JPS Aniceto](#), PF Lito, CM Silva, Journal of Chemical & Engineering Data, 2012, 57(6) 1766-1778.

**Modeling ion exchange equilibrium: Analysis of exchanger phase non-ideality**

[JPS Aniceto](#), SP Cardoso, TL Faria, PF Lito, CM Silva, Desalination, 2012, 290 43-53.

### BOOK CHAPTERS

**Preparative Chromatography: batch and continuous**

[JPS Aniceto](#), CM Silva, in: Analytical Separation Science (Volume 5), ed: Alain Berthod, 2015, Wiley-VCH.

**Recent simulated moving bed strategies for enhanced separations**

[JPS Aniceto](#), CM Silva, in: Recent Research Developments in Chemical Engineering, Transworld Research Network, 2014, 7 45-60, ISBN: 978-81-7895-593-3.

## SELECTED COMMUNICATIONS

### **Prediction of diffusivities in supercritical carbon dioxide using machine learning models**

JPS Aniceto, B Zêzere, CM Silva, EIFS2020, Santiago de Compostela, Spain, 2020.

### **Optimizing the separation of oleanolic and ursolic acids by simulated moving bed chromatography using a C30 adsorbent**

IS Azenha, JPS Aniceto, A Mendes, CM Silva, 2019 AIChE Annual Meeting, Orlando, USA, November 10-15, 2019.

### **Molecularly Imprinted Polymers for the chromatographic separation of triterpenic acids isomers**

JPS Aniceto, A Rudnitskaya, CM Silva, 13th International Chemical and Biological Engineering Conference (CHEMPOR 2018), Aveiro, Portugal, 2-4 October, 2018.

### **Isolation of high value triterpenic acids by Simulated Moving Bed (SMB): design of lab unit and modelling results**

JPS Aniceto, AF Silva, SP Cardoso, CM Silva, XX Encontro Luso-Galego de Química, Porto, Portugal, 2014.

### **High value triterpenic acids from Eucalyptus barks: design and construction of a Simulated Moving Bed (SMB) equipment for the isolation of pure compounds**

JPS Aniceto, CM Silva, FuBio Seminar 2013, Helsinki, Finland, 27 August, 2013.

## BOOK (as Editor)

### **Book of Short Abstracts 13th International Chemical and Biological Engineering Conference (CHEMPOR 2018)**

JAP Coutinho, CM Silva, JPS Aniceto, MMR de Melo, SP Cardoso, UA Editora, Universidade de Aveiro, 1st Edition – October 2018, ISBN: 978-972-789-565-6.

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## ADDITIONAL ACTIVITIES

**Volunteer at Re-food Aveiro** (2016 - 2020). Re-food is a community charity working to eliminate food waste and hunger on a neighborhood basis. I have been involved in the collection of excess food, its packaging and redistribution.

**Sports** I enjoy playing football and practice tennis at Clube Ténis de Aveiro.

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## REFERENCES

**Professor Carlos Manuel Silva** carlos.manuel@ua.pt | 916255199

Associate Professor, CICECO, Department of Chemistry, University of Aveiro

**Professor Inês Portugal** inesport@ua.pt

Assistant Professor and MIEQ Director, CICECO, Department of Chemistry, University of Aveiro

Further references can be provided upon request.