

PRELIMINARY PROGRAM



UNIVERSITAT
POLITÈCNICA
DE VALÈNCIA



IDS'2018



21st International Drying Symposium



September 11-14, 2018
Universitat Politècnica de València



Valencia, Spain



Universitat
de les Illes Balears



catedrainia



IDS Chairman

In this 40th anniversary of IDS it is a real honour to host at the Universitat Politècnica de València the celebration of IDS2018.

This is an event that, like in all other its predecessors, has attracted worldwide attention. Over 300 researchers from over 40 countries will present more than 450 papers at this event. As we can see IDS2018 promises to be a highly successful event. We are confident the founder of the IDS series Arun S. Mujumdar, would be very proud of it.

On this occasion we wanted to bring the event inside the University campus in order to get the students more actively involved in the organization and to make them aware of the importance and the impact of drying on many industries and different aspects of our life. This is a down to earth field that many times has been underestimated by our students and it's value needs to be recognized. Drying involves many aspects that may attract the interest of our students, from sustainability to product quality and the diversity of products. Valencia and the Mediterranean area have a long tradition of addressing the drying process; just remember the importance of dried fish on the Roman times that you still find in our markets.

The quality of the contributions is very high and the discussion during the event will enhance fruitful exchanges among the participants. We hope that the academic environment will help to attain the goal of a friendly and fruitful interaction in the beautiful city of Valencia. We believe this event will fulfil your expectations.

On behalf of the Organizing Committee

Antonio Mulet

IDS Honorary Chairman

I am delighted and truly honoured to welcome you to IDS2018. As you know this is a landmark event representing completion of four decades since the establishment of this biennial series in 1978 at McGill University, Montreal, Canada.

I am happy to note that IDS2018, like its predecessor events, has attracted significant academic and industry interest in drying research and development from around the world. Exchange of ideas and dissemination of knowledge about both fundamental aspects and industrial applications have been the prime motivations for holding IDS events around the globe. As an interdisciplinary and multidisciplinary field which combines complex multi-phase transport phenomena with material science, drying is also highly energy-intensive and has controlling influence on the dried product quality in diverse industrial sectors. I believe that IDS and sister conferences devoted to drying have had a very significant impact on enhancements in drying technologies and innovation in dryer design. Much remains to be done of course.

I am sure the participants in IDS2018 will find the proceedings and networking opportunities rewarding and their stay in the wonderful historic city of Valencia memorable.

Finally, on behalf of all the attendees may I take this opportunity to thank and congratulate the Program Chair and his hardworking Organizing Committee supported by authors, reviewers and of course all the volunteers assisting with the smooth running of this complex event.

Arun S. Mujumdar

Organizing Committee

Co-Presidents:

Jose V. Garcia-Perez

Universitat Politècnica de València, Spain

Susana Simal

Universitat de les Illes Balears, Spain

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Valeria Eim

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IDS 2018 PROGRAM AT A GLANCE

Tuesday , September 11th	
17:00 – REGISTRATION DESK OPEN (<i>Hall 3P building</i>)	
18:00 – WELCOME RECEPTION (<i>Salón Actos 3P</i>)	

Wednesday , September 12th			
8:00 – REGISTRATION DESK OPEN (<i>Hall 3P building</i>)			
9:00-9:30 – OPENING CEREMONY (<i>Auditorium 3N building</i>)			
9:30-10:30 - PLENARY LECTURE (<i>Auditorium 3N building</i>)			
10:30 – 11:30 h - COFFEE BREAK + Poster Session Drying Products I (<i>Hall 3P building</i>)			
11:30 h – 13:30 h - ORAL SESSIONS (<i>Rooms 3P building</i>)			
Session: Fundamentals, modeling and simulation I (<i>Salón Actos</i>)	Session: Drying Products I (3P.1.07)	Session: Drying Process I (3P.1.10)	Session: Drying Products II (<i>Salón Grados</i>)
13:30 – 15:00 - CONFERENCE LUNCH (<i>Outdoor hall 3P building</i>)			
15:00 h – 16:30 h - ORAL SESSIONS (<i>Rooms 3P building</i>)			
Session: Fundamentals, modeling and simulation II (<i>Salón Actos</i>)	Session: Drying Products III (3P.1.07)	Session: Drying Products IV (<i>Salon Grados</i>)	Session: Drying Process II (3P.1.10)
16:30 h – 18:00 h COFFEE BREAK + Poster session Process I (<i>Hall 3P building</i>)			
18:00 h – 20:30 h Tourist visit to Valencia city (bus + guided walking visit to downtown)			

Thursday , September 13th			
9:00-10:00 - PLENARY LECTURE (<i>Auditorium 3N building</i>)			
10:00 – 11:00 h - COFFEE BREAK + Poster Session Drying Modelling I (<i>Hall 3P building</i>)			
11:00 h – 13:00 h - ORAL SESSIONS (<i>Rooms 3P building</i>)			
Session: Fundamentals, modeling and simulation III (<i>Salón Actos</i>)	Session: Drying Products V (3P.1.10)	Session: Drying & Environment I (3P.1.07)	Session: Drying Process III (<i>Salón Grados</i>)
13:00 – 14:30 - CONFERENCE LUNCH (<i>Outdoor hall 3P building</i>)			
14:30 h – 16:00 h - ORAL SESSIONS (<i>Rooms 3P building</i>)			
Session: Fundamentals, modeling and simulation IV (<i>Salón Actos</i>)	Session: Drying Products VI (3P.1.10)	Session: Drying Process IV (3P.1.07)	Session: Drying Process V (<i>Salón Grados</i>)
16:00 h – 17:30 h COFFEE BREAK + Poster session Drying Modelling II and Process II (<i>Hall 3P building</i>)			
20:30 h – 24:00 h Gala dinner (<i>Veles e Vents building-Port of Valencia</i>)			

Friday , September 14th		
09:00 h – 11:15 h - ORAL SESSIONS (<i>Rooms 3P building</i>)		
Session: Drying Products VII (<i>Salon Grados</i>)	Session: Drying Process VI (3P.1.10)	Session: Industrial Drying (<i>Salón Actos</i>)
11:15 h – 12:15 h COFFEE BREAK + Poster session Drying Products II and Environment I (<i>Hall 3P building</i>)		
12:15 h – 13:15 h - ROUND TABLES (<i>Rooms 3P building</i>)		
Improving Academia-Industry links to improve drying (<i>Salón Actos</i>)		The freeze drying of pharmaceuticals in the presence of Alcohols as Co-Solvents (<i>Salón Grados</i>)
13:15 – 13:30 - CLOSING CEREMONY (<i>Salón Actos 3P building</i>)		



Tuesday, September 11th

17:00 – Registration desk open (Hall 3P building)

18:00 – 19:00 Welcome reception. (Salón actos - 3P building). Once the ceremony was finalized, drinks & foods will be served on the hall of 3P building.



Wednesday, September 12th

8:00 – REGISTRATION DESK OPEN (Hall 3P building)

9:00-9:30 – OPENING CEREMONY (Auditorium 3N building)

9:30-10:30 - PLENARY LECTURE (Auditorium 3N building)

Chair: A Mulet

#7631 - Arun S. Mujumdar, Hong-Wei Xiao, Sachin V. Jangam
Role of IDS in Global Drying R&D

10:30 – 11:30 h - COFFEE BREAK Poster Session Drying Products I (Hall 3P building)

11:30 h – 13:30 h - ORAL SESSIONS (Rooms 3P building)

Session: Fundamentals, modeling and simulation I (Salón de actos)

Chairs: Alex I Martynenko; Jose Benedito

KEY NOTE

11:30 #7932 - Alex I Martynenko, Tadeusz Kudra
Electrohydrodynamic (EHD) drying: fundamentals and applications

ORAL PRESENTATIONS

12:00 #7245- Carsten Seidel, Christoph Neugebauer, Robert Duerr, Andreas Bueck
Robust feedback control of continuously operated convective dryers for particulate materials

12:15 #7252 - Maciej Jaskulski, Artur Lewandowski, Ireneusz Zbiciński
Mathematical modeling of moisture evaporation in co-current foam spray drying

12:30 #7321 - Miguel A Garcia-Alvarado
Heat and mass transfer properties evaluation by linear regression fit of experimental temperature and moisture evolution on analytical solution of Luikov-modified equations

12:45 #7371 - Hiroyuki Kagami
A mathematical model of spray drying granulation process in formulation

13:00 #7423 - Aline Mesnier, Maroua Rouabah, Roman Peczkalski, Séverine Vessot-Crastes, Pascal Vacus, Julien Andrieu
Mechanical and thermal segregation of milli-beads during contact heating in a rotary drum. DEM modeling and simulation.

13:15 #7470 - Anna Adamska, Zdzislaw Pakowski, Robert Adamski



The investigation of internal pressure development in convective drying of shrinking and non-shrinking materials using green and fired clay as an example

Session: Drying Products I (3P.1.07)

Chairs: Cristina Ratti; Juan A. Carcel

KEY NOTE

11:30 #7653 - Cristina Ratti

Shrinkage during drying of foods: 25 years later

ORAL PRESENTATIONS

12:00 #7247 - Qixin Li, Robert H Driscoll, George Srzednicki

Effects of different drying conditions on curcumin concentration in turmeric

12:15 #7319 - Gerd Strenzke, Ievgen Golovin, Maximilian Wegner, Stefan Palis, Andreas Bück, Achim Kienle, Evangelos Tsotsas

Influence of drying conditions on process properties and parameter identification for continuous fluidized bed spray agglomeration

12:30 #7323 - S. Takashige, A. Hermawan Dwi, A. Sultana, Hirokazu Shiga, Shuji Adachi, Hidefumi Yoshii

Encapsulation of krill oil by spray drying

12:45 #7328 - Saheeda Mujaffar, Aveena Ramroop, Darin Sukha

Thin layer drying behaviour of fermented cocoa (*Theobroma cacao* L.) beans

13:00 #7332 - Mansoureh Geranpour, Zahra Emam-Djomeh, Gholamhassan Asadi

Microencapsulation of pumpkin seed oil by spray dryer under various process conditions and determination of the optimal point by RSM

13:15 #7356 - Cordin Arpagaus

Nano spray drying of pharmaceuticals

Session: Drying Process I (3P.1.10)

Chairs: Giana Almeida, Gabriela Clemente

KEY NOTE

11:30 #7943 - Giana Almeida, Patrick Perre

Non-Fickian diffusion in biomaterials

ORAL PRESENTATIONS

12:00 #7251 - Artur Lewandowski, Maciej Jaskulski, Ireneusz Zbiciński

Experimental analysis of particle breakage and powder morphology in foam spray drying

12:15 #7289 - Marc Oliver Wittner, Heike Petra Karbstein, Volker Gaukel

Spray drying of high viscous food concentrates: Investigations on the applicability of an Air-Core-Liquid-Ring (ACLR) nozzle for liquid atomization



12:30 #7300 - J. Havlik, T. Dlouhý
Heat recovery from biomass drying in energy systems

12:45 #7313 - Ayorinde K Rufai, John P Crawshaw
Capillary disconnect during drying in model porous media at different wettability

13:00 #7329 - H. T. Sabarez, S. Keuhbauch, K. Knoerzer
Ultrasound assisted low temperature drying of food materials

13:15 #7368 - Amanat Kaur, Yvan Gariépy, Valérie Orsat, Vijaya Raghavan
Microwave assisted fluidized bed drying of celery

Session: Drying Products II (Salón de grados)

Chairs: Ian C Kemp; Antonio Mulet

KEY NOTE

11:30 #7931 - Ian C Kemp, Alex van Millingen, Houda Khaled, Lewis Iler
Simultaneous wetting and drying; fluid bed granulation and tablet film coating

ORAL PRESENTATIONS

12:00 #7544 - Tales Alexandre Costa-Silva, Ana Karine Furtado Carvalho, Claudia Regina Fernandes Souza, Larissa de Freitas, Heizir F Castro, Wanderley Pereira Oliveira
Immobilization of *Candida rugosa* lipase on eco-friendly supports by spouted-bed technology: Use in the synthesis of isoamyl caprylate

12:15 #7593 - Lu Zhang, Remko M. Boom, Xiao Dong Chen, Maarten A.I. Schutyser
Recent developments in functional bakery products and the impact of baking on active ingredients

12:30 #7624 - Gabriela Silveira da Rosa, Sai Vanga, Yvan Gariépy, Vijaya Raghavan
The effect of drying on the mechanical properties and structure of biodegradable films

12:45 #7629 - Konrad Nowak, Magdalena Zielinska
The effect of pre-treatment on the texture of cranberries subjected to hybrid drying

13:00 #7694 - Ignat Tolstorebrov, Trygve Magne Eikevik, Inna Petrova, Yulia Shokina, Michael Bantle
Investigation of influence of pre-treatment and low-temperature on drying kinetics, sorption properties, shrinkage and color of brown seaweeds (*Saccharina Latissima*)

13:30 – 15:00 - CONFERENCE LUNCH (Outdoor hall 3P building)



15:00 h – 16:30 h - ORAL SESSIONS (Rooms 3P building)

Session: Fundamentals, modeling and simulation II (Salón Actos)

Chairs: Antonello A Barresi, Jose V. Garcia-Perez

KEY NOTE

15:00 #7652 - Antonello A Barresi, Roberto Pisano

Process intensification and process control in freeze-drying

ORAL PRESENTATIONS

15:30 #7474 - Lisa Mielke, Andreas Bück, Evangelos Tsotsas

Multi-zone & multi-compartment model for dynamic simulation of horizontal fluidized bed granulator

15:45 #7499 - Xiao Dong Chen, Aditya Putranto

Measuring REA drying kinetics through temperature-water content relationship

16:00 #7531 - Jee-Ching Wang, Roberto Bruttini, Athanasios Liapis

The construction of thermodynamic expressions needed in the physicochemical mathematical model required for the rational quantitative evaluation of the freeze drying process of pharmaceutical solutions employing tertiary butyl alcohol as a co-solvent

16:15 #7485 - Mohamed Hemis, Vijaya Raghavan

Modeling of dielectric properties of durum wheat (*Triticum durum*) in a frequency range of 0.6 GHz - 3 GHz

Session: Drying Products III (3P.1.07)

Chairs: Valeria Eim, Pedro J. Fito

KEY NOTE

15:00 #7898 - Valeria Eim, Esperanza Dalmau, Juan A. Cárcel, Susana Simal

Influence of drying on in vitro gastric digestion of beetroot: evaluation of the microstructure

ORAL PRESENTATIONS

15:30 #7376 - Peter Kubbutat, Ulrich Kulozik

Acceleration of freeze drying by microwave application and by stabilized foamed matrices containing sensitive biomolecules with optimized retention of physiological activity

15:45 #7377 - Sarra Jribi, Hela Gliguem, Andras Nagy, Nagy Gabor Zsolt, Lilla Szalóki-Dorkó, Zoltan Naár, Ildiko Bata-Vidács, Sarra Marzougui, Zsuzsanna Cserhalmi, Hajer Debbabi

Evolution of "Chili" Tunisian landrace durum wheat sprouts properties after drying

16:00 #7384 - Sabyasachi Mondal, Puja Agarwala, Suvankar Dutta, Vishvas Naik-Nimbalkar, Pratik Pande, Sunil Dhumal

Cellulosic fibre drying: fundamental understanding and process modeling

16:15 #7387 - Kehinde Adekunbi Taiwo



Effects of pretreatment and drying methods on the quality of *Amaranthus viridis* leaves

Session: Drying Products IV (Salón Grados)

Chairs: Magdalini Krokida, Nuria Martinez-Navarrete

KEY NOTE

15:00 #8265 - Magdalini Krokida

Nonthermal Encapsulation Methods – A case study of tomato by-products treatment

ORAL PRESENTATIONS

15:30 #7392 - Alexandra Buess, Benoit Haut

Drying of a synthetic human mucus: experimental study and modelling

15:45 #7400 - Pierre Verlhac, Séverine Vessot-Crastes, Ghania Degobert, Claudia Cogné, Julien Andrieu, Laurent Beney, Patrick Gervais

Study and optimization of freeze-drying cycles of a model probiotic strain

16:00 #7537 - Takaharu Tsuruta, Takuma Ogawa, Ryosuke Abe, Hirofumi Tanigawa

Ambient temperature drying of therapeutic protein solution with use of microwave

16:15 #7520 - Desi Sakawulan, Richard Archer, Chaleeda Borompichaichartkul

Enhancing antioxidant property of instant coffee by microencapsulation via spray drying

Session: Drying Process II (3P.1.10)

Chairs: Ireneusz Zbiciński, Susana Simal

KEY NOTE

15:00 #7621 - Ireneusz Zbiciński, Mariia Sobulska, Marcin Piątkowski

Equipment, mechanism and perspectives of flame spray drying

ORAL PRESENTATIONS

15:30 #7501 - Stanislav Pavlovich Rudobashta, Galina Albertovna Zueva, V.M. Dmitriev, E.A. Muravleva

Drying the corn in a farm heat pump dryer with fluidized bed

Optimization of processing parameters during foam mat drying of hybrid (EVA F1) tomato pulp

15:45 #7511 - Yuchuan Wang, Ying Cui, Bo Wang, Min Zhang

Ultrasonic atomizing-assisted spray drying: Effect on the quality of skimmed milk powders

16:00 #7502 - Adejoke Awodein, Olajide Sobukola, Abdul-rasaq Adebawale, Lateef Sanni, Oluseye Onabanjo, Augustine Okoruwa

16:15 #7489 - Theo Guenter Kieckbusch

Accelerated drying of whole unpeeled cherry tomatoes after skin abrasive treatment

16:30 h – 18:00 h COFFEE BREAK + Poster session Drying Process I (Hall 3P building)



16:30 h – 18:00 h MEETING OF THE INTERNATIONAL ADVISORY PANEL (Sala Juntas 3P building)

18:00 h – 20:30 h TOURIST VISIT TO VALENCIA CITY (BUS + GUIDED WALKING VISIT TO DOWNTOWN)



Thursday, September 13th

9:00-10:00 - PLENARY LECTURE (Auditorium 3N building)

Chair: C. Rossello

#7936 - Evangelos Tsotsas

Structure formation by drying

10:00-11:00 h - COFFEE BREAK + Poster Sessions Drying Modelling I (Hall 3P building)

11:00 h – 13:00 h - ORAL SESSIONS (Rooms 3P building)

Session: Fundamentals, modeling and simulation III (Salón Actos)

Chairs: Reinhard Kohlus; Jose V. Garcia-Perez

KEY NOTE

11:00 #7814 - Reinhard Kohlus, Tobias Balke, Annika Linke, Nora Ruprecht

Optimal and innovative spray drying of food powder – Product driven process design and scale up considerations

ORAL PRESENTATIONS

11:30 #7536 - Sepideh Afshar, Hasan Jubaer, Lloyd Metzger, Hasmukh Patel, Cordelia Selomulya, Meng Wai Woo

Implementation of p-controller in Computational Fluid Dynamics (CFD) simulation of a pilot scale outlet temperature controlled spray dryer

11:45 #7558 - Domenico Colucci, José Manuel Prats-Montalban, Davide Fissore, Alberto Ferrer Riquelme

Application of multivariate image analysis to thermal images for in line monitoring of the freeze-drying process

12:00 #7607 - Francis Courtois, Emmanuel Bernuau, Daniel Goujot, Hedi Romdhana

A model reduction alternative method to boost simulations of drying of solid foods with simple geometries

12:15#7616 - Barbara Sturm, Roberto Moschetti, S.O.J. Crichton, Sharvari Raut, Michael Bantle, Riccardo Massantini

Feasibility of Vis/NIR spectroscopy and image analysis as basis of the development of smart-drying technologies

12:30 #7630 - Charlotte Van Engeland, David Vidal, Laurent Spreutels, Robert Legros, Benoît Haut, François Bertrand

Intermittent drying of yeast pellets: a multiscale modeling approach

12:45 #7615 - Francesco Marra, Gianpaolo Ruocco, Giuseppe Titomanlio

The parametric problem of enhanced multiphysics drying by time scale comparison



Session: Drying & Environment I (3P.107)

Chairs: Angélique Léonard, Neus Sanjuán

KEY NOTE

11:00 #7851 - Angélique Léonard

Using Life Cycle Assessment methodology to minimize the environmental impact of dryers

KEY NOTE

11:30 #7935 - Shusheng Pang

Recent advances in biomass drying for energy generation and environmental benefits

ORAL PRESENTATIONS

12:00 #7963 - Nobusuke Kobayashi, Kenji Kamiya, Kazuki Okada, Yuma Tachibana, Takumi Ito, Hironari Ooki, Yoshinori Itaya

Efficient sludge drying by addition of drying accelerator

12:15 #7842 - Nabil Kechaou, E Ammar

Biodrying process: a sustainable technology for treatment of municipal solid wastes organic fraction

Session: Drying Products V (3P.1.10)

Chairs: Sakamon Devahastin; Juan A. Carcel

KEY NOTE

11:00 #8278 - Sakamon Devahastin

Superheated Steam Spray Drying: My new playground

ORAL PRESENTATIONS

11:30 #7722 - Özgün Köprüalan, Işıl İlter, Saniye Akyıl, Mehmet Koç, Figen Ertekin

Microencapsulation of curcumin by spray drying and its stability

11:45 #7744 - **Elsa Maritza Acosta-Piantini**, M. Carmen Villaran, J. Ignacio Lombraña

Stabilization of encapsulated probiotics from the bacterium *Lactobacillus casei* by different drying techniques

12:00 #7770 - Elia Ana Sirvent, Luis Torró, Carmen Veciana

Comparative study of the drying of extracts proceeding the olive by means of liofilization and spray-drier

12:15 #7872 - Jorge Moreno, P. Zúñiga, M. E. Guerra, K. Mella

Ohmic heating/vacuum impregnation treatments on osmodehydrated apples enriched in polyphenols from concentrated pomegranate juice

12:30 #7794 - Neila Bahloul, M. A. Balti, M. S. Guellouze, Nabil Kechaou

Coupling of microwave radiations to convective drying for improving fruit quality

12:45 #7723 - Hedi Romdhana, Samir Mezdour

Drying of insects and larvae: towards valorization into high-value functional proteins



Session: Drying Process III (Salón Grados)

Chairs: Ana Andres, Clara Talens

KEY NOTE

11:00 #7725 - Ana Andres, Ruth De los Reyes, Ana Heredia, Elias De los Reyes
Innovative microwave technologies for food drying processes

KEY NOTE

11:30 #7875 - Clara Talens, Marta Castro-Giráldez, Pedro J. Fito c

ORAL PRESENTATIONS

12:00 #7515 - Jun Qiu, R. M. Boom, M.A.I. Schutyser
Agitated thin-film drying of spinach juice

12:15 #7551 - M. Bantle, Christian Andre Kopp, I.C. Claussen, I. Tolstorebrov
Influence of the low temperature drying process on optical alternations of organic apple slices

12:30 #7581 - Pascal Le Bideau, Mireille Richard-Plouet, Patrick Glouannec, Anthony Magueresse, D. Iya-Sou, L. Brohan
Synthesis of titanium dioxide precursor by the hydrolysis of titanium oxychloride solution

12:45 #7625 - Daniel Rivera, Mariana Valverde, Ana Valera, Ana Torrejón, Joaquín Espí, Encarna Gómez, Begoña Ruiz
Stabilization of Lactobacillus sp. with enhanced thermal resistance by spray-drying

13:00 – 14:30 - CONFERENCE LUNCH (Outdoor hall 3P building)

14:30 h – 16:00 h - ORAL SESSIONS (Rooms 3P building)

Session: Fundamentals, modeling and simulation IV (Salón Actos)

Chairs: Enrique Riera; Jose Benedito

KEY NOTE

14:30 #7897 - Enrique Riera, Juan A. Gallego-Juárez, Roque R. Andrés, Antonio Mulet, José V. García-Pérez, Juan A. Cárcel
Power ultrasonic technologies for drying process intensification at low temperatures

ORAL PRESENTATIONS

15:00 #7643 - Akane Horie, Takashi Kobayashi, Kyuya Nakagawa M
Modeling of atmospheric freeze-drying for sliced fruits

15:15 #7756 - Juan Angel Tomas-Egea, Marta Castro-Giraldez, Pedro J Fito
Thermodynamic model of freeze-drying of poultry breast using infrared thermography

15:30 #7512 - Sanjay Kumar Patel, Mukund Haribahu Bade
Energy analysis and conservation opportunities in spray dryers



15:45 #7886 - Jader Rodríguez-Cortina, Sebastián Escobar, Julián Gómez, Luis Daniel Daza, Henry Vaquiro

Mathematical modeling of drying kinetics of cocoa beans in a generalized coordinate system

Session: Drying Products VI (3P.1.10)

Chairs: Sara Spilimbergo; Isabel Hernando

KEY NOTE

14:30 #7753 - Sara Spilimbergo

Supercritical CO₂ drying of food matrices

ORAL PRESENTATIONS

15:00 #7878 - Jannika Bailey, Marta Castro-Giráldez, Alfredo Esteves, Pedro J Fito

Effect of solar radiation on cooking/drying process of grapes using solar oven

15:10 #8351 - M. M. Rahman, M. M. Billah, M.I.H. Khan, Azharul Karim M

Microstructural characterization of apple tissue during drying using X-Ray microtomography

15:30 #7647 - María Losada-Echeverría, Amani Taamalli, Vicente Micol, María Herranz-López, David Arráez-Román, Enrique Barraión-Catalán

Influence of drying temperature and harvesting season on phenolic content, antioxidant activity and antiproliferative capacity in cancer cell models of olive (*Olea europaea*) leaf extracts

15:45 #7876 - Djamel Mennouche, Abdelghani Boubekri, Bachir Bouchekima, Slimane Boughali, Rebiha Moumeni, Djihad Boutadjine

Valorization of the tomato to obtain a powder rich in antioxidant constituents

Session: Drying Process IV (3P.1.07)

Chairs: Grzegorz Musielak; Gema Moraga

KEY NOTE

14:30 #7833 - Grzegorz Musielak

Ultrasound enhancement of osmotic dehydration and drying – Process kinetics and quality aspects

ORAL PRESENTATIONS

15:00 #7686 - Umair Jamil Ur Rahman, Ilias Baiazitov, Artur Pozarlik, Gerrit Brem

CFD study of air flow patterns and droplet trajectories in a lab scale vortex chamber spray dryer

15:15 #7795 - Pablo García-Pascual, Francisco Pastor Martí, Charles Boddy, Jose Vicente Roig Borrell

Features of an industrial nut roasting process to enhance quality, safety and efficiency

15:30 #7813 - Bhaskar Thorat

Augmenting natural convection and conduction based solar dryer



15:45 #7791 - Nilobon Komonsing, Pramote Khuwijitjaru, Marcus Nagle, Busarakorn Mahayothee, Joachim Müller
Effects of Drying Temperatures on Color and Curcuminoid Contents in Turmeric

Session: Drying Process V (Salón grados)

Chairs: Satoshi Ohtake; Jose V. Garcia-Perez

KEY NOTE

14:30 #7855 - A. Langford, B. Balthazor, B. Bhatnagar, S. Tchessalov, M.J. Hageman, A. Lukas, M. Plitzko, B. Luy, **S. Ohtake**.

Beyond freeze-drying of biologics: vacuum-foam drying and spray freeze-drying

ORAL PRESENTATIONS

15:00 #7638 - Mine Ozcelik, Sabine Ambros, Ulrich Kulozik
Microwave-Freezing-Drying of fruit foams for the production of healthy snacks

15:15 #7762 - Bhaskar Thorat
Challenges in thermal & non thermal processing of algae

15:30 #7829 - Jader Rodriguez Cortina
Intermittent drying effect on total polyphenol and acetic acid in cocoa beans

15:45 #7858 - Samira Chouicha, Abdelghani Boubekri, Djamel Mennouche, Ilyes Frihi, Ahmed Rzezgua
Post-harvest treatment of algerian broad beans using two different solar drying methods

16:00 h – 17:30 h - COFFEE BREAK + Poster Session Drying Modelling II and Process II (Hall 3P building)

16:00 h – 17:30 h – MEETING OF THE WORKING PARTY ON DRYING (Sala de Juntas 3P building)

20:30 h – 24:30 h – GALA DINNER & AWARDS CEREMONY (VELES E VENTS BUILDING-PORT OF VALENCIA)



Veles e Vents Building. Venue of Gala Dinner of IDS2018.



Friday, September, 14th

9:00 h – 11:15 h - ORAL SESSIONS (Rooms 3P building)

Session: Drying Products VII (Salón Grados)

Chairs: Ian C Kemp, Min Zhang

KEY NOTE

9:00 #7293 - Min Zhang

Understanding fresh food drying: safety/quality, efficiency and energy consumption

ORAL PRESENTATIONS

9:30 #7810 - Bhaskar Thorat

Comparison of Individual Effect of Heat Transfer Mechanism in Solar Conduction Dryer

9:45 #7674 - Muge Urgu, Figen Kaymak-Ertekin, Nurcan Koca

The effects of reducing the fat content and using of microparticulated protein on the physical, reconstitution and morphological properties of spray dried cheese powder

10:00 #7318 - Ivanna Bashkir, Tadeusz Kudra, Alex Martynenko

Electrically enhanced drying of white champignons

10:15 #8374 - Tórstein Vincent Joensen, Maximilian Kuhnenn, Frank Vinther, Mads Reck, Cameron Tropea

Rotary wheel atomizer study using Computational Fluid Dynamics and full-scale testing

Session: Drying Process VI (3P.1.10)

Chairs: Sueli Rodrigues; Juan A. Carcel

KEY NOTE

9:00 #7303 - Thayane Rabelo Braga, Ebenezer Oliveira Silva, Sueli Rodrigues, Fabiano Andre Narciso Fernandes

Drying of mangoes applying pulsed UV light as pre-treatment

ORAL PRESENTATIONS

9:30 #7372 - Ming Liu, Shan Wang, Rongtang Liu, Xiaoqu Han, Junjie Yan

The consumption of exergy for lignite drying with different technologies: a comparative theoretical study

9:45 #7380 - José Couceiro, Lars Hansson, Ahec Ambrož, Dick Sandberg

CT-scanning of the drying process of Eucalyptus nitens

10:00 #7396 - Benoit Haut, Frédéric Debaste

Experiments, modeling and optimization of fluidized bed PVC drying

10:15 #7402 - M. Hernández-Carrión, M. Moyano-Molano, L. Ricaurte, F.L. Moreno, Maria Ximena Quintanilla-Carvajal



Effects of different drying methods on the physicochemical properties of powders obtained from high-oleic palm oil nanoemulsions

10:30 #7426 - Francisco J. Durán-Olivencia, Milad Farzad, Burt S. Tilley, Jamal S. Yagoobi
Multifluid macroscopic approach to drying in papermaking

10:45 #7469 -Özle Ünlüeroğlugil, Hira Yüksel, Gülşah Çalışkan Koç, Safiye Nur Dirim
Freeze dried quince puree with the addition of different amounts of maltodextrin: physical and powder properties

11:00 #7569 - Hamza Bozkir, Yeliz Tekgül, Taner Baysal
Drying of orange slices using vacuum microwave dryer

Session: Industrial Drying (Salón Actos)

Chairs: Jamal Yagoobi, Hao Feng, Irfan Ahmad, Sheyla Ramsay

ORAL PRESENTATIONS

9:00 #8279 - Maria Santafé, Ignacio Cantera, Robert Bullich
Azbil Telstar (Spain)
Freeze drying and current challenges

9:20 #8354 - A. Langford, B. Luy, S. Ohtake.
Pfizer, Inc. (USA) Meridion Technologies GmbH (Germany)
Current needs of the pharmaceutical industry: opportunities and challenges for implementing novel drying technologies

9:40 #8355 - Juan Antonio Gallego-Juárez, Enrique Riera, Ignacio Martinez
Pusonics S.L. (Spain)
Power ultrasonic technology for drying heat sensitive products

10:00 #8359 - Michael Jacob, A. Teiwes
Glatt Ingenieurtechnik GMBH (Germany)
Influence of process conditions on product performance for industrial fluidized bed applications

10:20 #8360 - Michael Whaley
Buhler Aeroglide (USA)=
Dryer performance – Reducing energy consumption, improving the product and sharing information

10:40 #7764 - Rosaria Augelletti, Sonia Panzieri, Sinan Al Qudah, Mohammad Al Qudah
Marsina Engineering SRL (Ital)
Spray drying technology for detergent powder production: study of an industrial reality

11:15 h – 12:15 h - COFFEE BREAK + Poster session Drying Products II and Environment I (Hall 3P building)



12:15 h – 13:15 h - ROUND TABLES (Rooms 3P building)

Round table: Improving Academia-Industry links to improve drying (Salón Actos)

Chairs: Ian Kemp

Round table: The freeze drying of pharmaceuticals in the presence of Alcohols as Co-Solvents (Salón Grados)

Chairs: Athanasios I. Liapis; Roberto Bruttini, Julien Andrieu

13:15 h – 13:30 h - CLOSING CEREMONY, AWARDS FOR THE BEST POSTER AND ORAL PRESENTATION (Salón Actos 3P building)



POSTERS SESSIONS

Wednesday, September 12th, 10:30-11:30

Poster Session: DRYING PRODUCTS I (Main hall 3P. Building)

#7256

Morphology studies of salt deposits from drying sessile droplets

Franziska Sophia Sondej, Mirko Peglow, Andreas Bück, Evangelos Tsotsas

#7277

Solar drying of strawberry coated with nopal mucilage: It's effect on phenolic compounds

M.J. León,, A. López-Ortiz, F.I. Pilatowsky, L.L.L. Méndez

#7307

Optimization of the spray drying process for the obtaining of coconut powder (*Cocos nucifera* L.) fortified with functionally active compounds

J. C. Lucas-Aguirre, G. Giraldo, R. M. Cortes

#7322

Agglomeration of hydrolyzed collagen with blackberry pulp in a fluidized bed

Thayna Rua Viegas, Osvaldir Pereira Taranto

#7357

Effect of phospholipid composition on the structure and physicochemical stability of proliposomes incorporating curcumin and cholecalciferol

Matheus Andrade Chaves, Samantha Cristina Pinho

#7374

Drying characteristics and drying quality of pineapple slices using a pulsed vacuum drying process

Jun Wang

#7398

Experimental characterization and modeling of the drying of Kampot pepper (*Piper nigrum* L.) in Cambodia

Elen Morm, Benoit Haut, Sokneang In, Frédéric Debaste

#7399

Monitoring of the evolution of several physicochemical parameters of Amazonian cocoa beans during their drying

Christelle Herman, Justine Fauvieu, Benoit Haut

#7404

Effect of different drying processes on mass transfer, color properties and chemical composition of *Physalis peruviana* pulp

Luis A. Puente, Antonio Vega-Galvez, Alexis Pasten, Ivette Fuentes, Elsa Uribe



#7407

Drying of Iranian seedless barberry (*Berberis vulgaris* L.) in microwave assisted fluidized bed drier

Morteza Rashidzadeh, Gholamreza Askari, Zahra Emamdjomeh

#7413

Physical properties of commercial infant milk formula products

Eoin G Murphy, Nicolas E Regost, Yrjo H Roos, Mark A Fenelon

#7428

Drying kinetics and mechanical properties of the black spruce (*Picea mariana* (Mill) B.S.P.) wood using a vacuum and mechanical pressure process

Kamel Ben Dhib

#7448

Encapsulation efficiency and physical properties of pink pepper oleoresin (*Schinus molle* L.) spray dried with prebiotics carriers

Soraia Vilela Borges, Jayne Abreu Figueiredo, Pedro Henrique Campelo, Regiane Victória Barros Fernandes Botrel, Diego Alvarenga Botrel

#7449

Relaxation of ceramic tile stresses generated by fast drying: a kinetic model

J. L. Amorós, V. Cantavella, E. Blasco

#7452

Fixed-bed drying of grains: analysis of the structural properties of packed-beds of non-spherical particles

Heitor O Nogueira Altino, Maria do Carmo Ferreira

#7459

Comparison between maltodextrin and inulin on the physical properties of the extract of green corn powder

Soraia Vilela Borges, Gerson Reginaldo Marques, Rhana A. R. Teodoro, Diego Alvarenga Botrel, Regiane Victória B. F. Botrel

#7460

Effects of ozone pretreatment on drying kinetics and quality of Granny Smith Apple dried in a fluidized bed dryer

Thatyane Vidal Fonteles, Ronnyely Braz Reis do Nascimento, Sueli Rodrigues, Fabiano Andre Narciso Fernandes

#7461

Effects of assistance of high frequency dielectric and infrared heating on vacuum freeze drying characteristics of food model

Atsushi Hashimoto, Ken-ichiro Suehara, Takaharu Kameoka, Kazuhiko Kawamura

#7462

Estimation of the apparent glass transition temperature of spray-dried emulsified powders and yeast powders by their flavor release behavior under temperature ramping conditions

A. Sultana, J. L. Zhu, H. Yoshii



#7477

Hot air drying combined vacuum-filling nitrogen drying of apple slices: Drying characteristics and nutrients

Xiaoli Huang, T. Li, S.N. Li, Z.H. Wu, J. Xue

#7478

Bioavailability of freeze-dried and spray-dried grapefruit juice vitamin C

María del Mar Camacho, Marta Igual, Juan José Martínez-Lahuerta, Nuria Martínez-Navarrete

#7479

Economic feasibility of freeze-drying to obtain powdered fruit

María del Mar Camacho, Miguel Ángel Casanova, Loreto Fenollosa, Javier Ribal, Juan José Martínez-Lahuerta, Nuria Martínez-Navarrete

#7480

Influence of freeze-drying conditions on orange powder flowability

Mariana Usganda, Andrea Silva, Luis Egas, María del Mar Camacho, Nuria Martínez-Navarrete

#7481

Impact of shelf temperature on freeze-drying process and porosity development

L. A. Egas-Astudillo, A. Silva, M. Uscanga, N. Martínez-Navarrete, M. M. Camacho

#7486

Determination of the moisture content of white and yellow corn from ohaji in imo state of nigeria using the dry-weight technique

Offurum Julius Chigozie

#7487

Effect of saccharide additives on dehydration–drying kinetics and quality properties of dried kiwi fruit products

Shigeaki Ueno, Rei Iijima, Mari Harada, Hsiuming Liu, Reiko Shimada, Ken Fukami

#7488

Effects of freezing-thawing on drying kinetics and enzymatic reaction in soybean

Shigeaki Ueno, Natsuko Iryo, Shoji Sasao, Tetsuya Araki, Gab-soo Do

#7490

Drying of wastes of almond shells in conical spouted beds

Maria J San Jose, Sonia Alvarez, Raquel Lopez

#7496

Effect of air drying temperature on phytochemical properties of brown seaweed *Bifurcaria bifurcate*

Santiago Vilas Arufe, Jorge Sineiro, Francisco Chenlo, Ramón Moreira

#7514

Comparison on conductive drying technologies for drying of milk



Jun Qiu

#7516

Hot air and microwave-vacuum drying kinetics and quality of cranberries as influenced by pretreatment , hot air temperature and microwave power

Magdalena Zielinska, Danuta Zielinska, Marek Markowski

#7518

Effect of spray drying conditions on antioxidants activity, flavonoids and total phenolic compounds of stevia rebaudiana

Irene Chaparro-Hernández, Juan Rodríguez-Ramírez, Lilia L. Méndez-Lagunas, Luis Gerardo Barriada-Bernal

#7519

Effects of drying conditions on the content of glycosides and antioxidants of packed bed of stevia leaves

Juan Rodríguez-Ramírez, Beatriz Noyola-Altamirano, Luis Gerardo Barriada-Bernal, Lilia L. Méndez-Lagunas

#7529

Experimental investigation of internal pressure during drying of highly shrinking materials using celeriac root as an example

Robert Adamski

#7530

Effect of ultrasound on drying kinetics of El Henna leaves (*Lawsonia inermis*)

Said Bennaceur, Lyes Bennamoun, Antonio Mulet, Belkacem Draoui, Juan A. Cárcel

#7554

Spray drying of lipid nanosystems (SLN and NLC) loaded with *Syzygium aromaticum* essential oil

Debora Morais Rosa, Wanderley Pereira Oliveira

#7561

Decontamination of dried red pepper powders pretreated by cold plasma

Deng Li Zhen, Zhang Qian, Ji Xian Wei, Zhang Xiao Lin, Gao Zhen Jiang, Xiao Hong Wei

#7568

Ultrasound assisted osmotic dehydration of persimmon

Hamza Bozkir, Ahsen Rayman Ergün, Gülhan Metin, Emine Serdar, Taner Baysal

#7573

Influence of drying conditions on chemical characteristics of the essential oils from lemongrass (*Cymbopogon citratus* (DC) Stapf.) and orange (*Citrus* sp.) peels

Gabriela Cunha Bonilha, Carmen Boyaciyán, Gustavo Nakamura Alves Vieira

#7576

Influence of drying mode on physical and thermal properties of fish protein hydrolysates

Inna Petrova



#7600

Effect of rehydration on texture properties of Mexican plum (*Spondias purpurea* L.) dehydrated by tray drying and freeze drying

Paulina Guillen-Velazquez, Cinthia Muñoz-López, Denis Cantu-Lozano, Guadalupe Luna-Solano

#7609

Evaluation of the physicochemical properties of dehydrated artisanal cheese during storage

Carlos Jair Calis-Pérez, Alfredo Domínguez-Niño, Galo Rafael Urrea-García, Guadalupe Luna-Solano

#7612

The infrared radiation and vacuum assisted drying kinetics of flue-cured tobacco leaf and its drying quality analysis

Wenkui Zhu, Gaofei Guo, Chaoxian Liu, Liangyuan Cheng, Le Wang

#7613

Quality design of spray dried mannitol microparticles: Capturing the vital importance of process parameters on particle properties

Niyanhuan Jiang, Shanshan Wang, Ruohui Lin, Zeneng Cheng, Wenjie Liu

#7637

Moisture sorption isotherms and isosteric heat sorption of habanero pepper (*Capsicum chinense*) dehydrated powder

Mario Luna-Flores, Mariana Gisela Peña-Juarez, Angélica Mara Bello-Ramirez, Javier Telis-Romero, Guadalupe Luna-Solano

#7642

Observation of microstructure change during freeze-drying by in-situ X-ray Computed Tomography

Kyuya Nakagawa, Shinri Tamiya, Shu Sakamoto, Gabsoo Do, Shinji Kono, Takaaki Ochiai

#7649

A green coffee based product and its comparison to commercial products regarding the antioxidant capacity

F. C. A. Souza, E. F. Souza, S. M. Pontes, W. F. Leal Junior, O. Freitas-Silva, R. I. Nogueira

#7650

Nutritional potential of dehydrated residues from rice milk production

L. Ramos Silva, A. C. A. B. Casari, J. I. Velasco, F. M. Fakhouri

#7651

Microencapsulation of vanilla extract via spray drying and spray chilling
Figen Ertekin

#7654

Effect of storage conditions on the bioactive compounds degradation of microencapsulated moringa oleifera spray dried ethanolic extracts



Beatriz Juliana Yerena-Prieto, Lucio Abel Vázquez-León, Marco Antonio Salgado-Cervantes, Victor José Robles-Olvera, Miguel Ángel García-Alvarado, Guadalupe Del Carmen Rodríguez-Jimenes

#7655

Healthy apple snack developed using microwaves

Dinar Fartdinov, Josep Comaposada, Israel Muñoz, Nieco De Wit, Pere Gou, Maria Dolors Guàrdia

#7656

Solar convective drying kinetics and sorption isotherms of Citrus aurantium flowers

Hicham El Ferouali, Ahmed Zoukit, Said Doubabi, Naji Abdenouri

#7657

Effect of the combination of osmotic, convective dehydration and frying on the physical and chemical properties of Taro chips (Colocasia esculenta)

Montserrat Chávez-González, Guadalupe del Carmen Rodríguez-Jimenes, Miguel Angel Garcia-Alvarado, Victor Jose Robles-Olvera, Marco Antonio Salgado-Cervantes

#7664

Microencapsulation of fucoxanthin by using spray drying method

Figen Ertekin

#7675

Physical characterization of spray dried whole dromedary milk powder: A multi-factorial investigation in relation to its storage proprieties

Ahmed Zouari, Pierre Schuck, Frédéric Gaucheron, Claire Gauzelin-Gaiani, Guillaume Delaplace, Hamadi Attia, Mohamed Ali Ayadi

#7689

Organic apples (cv. Elstar) quality evaluation during hot-air drying using Vis/NIR hyperspectral imaging

Luna Shrestha, Roberto Moschetti, Stuart Crichton, Oliver Hensel, Barbara Sturm

#7691

Physicochemical parameters and consumer acceptance in espresso and american coffee pods

Lina Ximena Parrado, Andrés Felipe Bahamon, Nelson Gutierrez

#7707

Physicochemical characterization of mesquite flours

S. Sandoval Torres, L. Reyes López, L. Méndez Lagunas, J. Rodríguez Ramírez, G. Barriada Bernal

#7716

Thermal stability of amorphous sugar matrix, dried from methanol, as an amorphous solid dispersion carrier

K. Imamura, K. Takeda, K. Yamamoto, H. Imanaka, N. Ishida

#7719



Effect of tray dryer's independent variables (drying temperature and air velocity) on the quality of olive pomace and system's energy efficiency
Ulaş Baysan, Mehmet Koç, A. Güngör, Figen Kaymak-Ertekin

#7739

Identification of key factors determining the surface oil concentration of encapsulated lipid particles produced by spray drying
Annika Linke, Tobias Balke, Reinhard Kohlus

#7743

Drying-induced changes of phytochemicals in response to carriers added during transformation of blackcurrant juice into powders
Anna Michalska

#7745

Influence of drying method in yield and composition of essential oils of three Mediterranean herbs
Juan A. Llorens-Molina, Sandra Vacas-Gonzalez, Guillem Cebrián Ortega, Jose V. Garcia-Perez

#7748

Convective drying of pork liver in a wide temperature range
Eduardo A. Sanchez-Torres, Jose Benedito, Juan A. Llorens-Molina, Marina Contreras, Jose M. Lorenzo, Jose V. Garcia-Perez

#7759

Kinetics of algae drying
Bhaskar Thorat

#7760

Technological and nutritional aspects of gluten-free pasta based on chickpea flour and tiger nut flour
M. E. Martín-Esparza, G. B. Bressi, A. Raga, A. Albors

#7774

Study of the effect of various heat treatments on some physico-chemical, nutritional and functional properties of acerola
Angel Argüelles, Ana Heredia, Ana Andres

#7784

Flow ability of the coking coal in a superheated steam gravity bed dryer
Zhonghua Wu

#7785

Experimental investigation of drying of malt bagasse
B. D. Zorzi, K. Machry, P. Krolow, C. M. Moura, E. G. Oliveira, G. S. Rosa

#7786

Influence of the acoustically assisted low temperature drying of lemon peel on the pectin extraction yield



Mónica María Umaña Zamora, Beatriz Rayo, Henry Váquiro, José Bon, Oscar Rodríguez



Wednesday, September 12th, 16:30-18:00

Poster Session: DRYING PRODUCTS I (Main hall 3P. Building)

#7268

Drying the corn in a farm heat pump dryer with fluidized bed

S. P. Rudobashta, G. A. Zueva, V. M. Dmitriev, E. A. Muravleva

#7269

Heat and mass transfer modelling of continuous Wurster-spray-granulation with external product classification

Daniel Mueller, Andreas Bueck, Evangelos Tsotsas

#7271

Concept of heat recovery in drying with chemical heat pump

Michal Tylman, Maciej Jaskulski, Pawel Wawrzyniak, M. Czapnik

#7273

Concept of heat recovery in drying with chemical heat pump

Bartosz Opara, Maciej Jaskulski, Marcin Piątkowski, Paweł Wawrzyniak, Ireneusz Zbiciński

#7280

Agglomeration of spray dried milk powder with the addition of carob, cinnamon, and ginger powders

Safiye Nur Dirim, Hira Yüksel, Gülşah Çalışkan Koç

#7294

Drying characteristics and quality of lemon slices dried undergone Coulomb force assisted heat pump drying

S. K. Chin, Y. H. Lee, B. K. Chung

#7297

Impact of thin layer drying on bioactive compounds of jaboticaba (*Plinia cauliflora*) peel

Karine Machry, Marcílio Machado Morais, Gabriela Silveira da Rosa

#7310

Experimental investigation on pore size distribution and drying kinetics during lyophilization of sugar solutions

P. Foerst, M. Lechner, N. Vorhauer, H. Schuchmann, E. Tsotsas

#7333

Microwave assisted convective drying of kale (*Brassica oleracea* L. var. *sabellica* L.) at stationary and non-stationary conditions

Dominik Mierzwa, Justyna Szadziński

#7334

Drying effect on the content of *Warionia saharae* leaves Essential Oils

Fedol Amel

#7339

Effect of Freezing-Thawing on Drying Kinetics and Enzymatic Reaction in Soybean



Shigeaki Ueno, Natsuko Iryo, Shoji Sasao, Tetsuya Araki, Gab-soo Do

#7340

Influence of drying conditions on continuous spray fluidized bed layering granulation with internal and external separation

Martin Schmidt, Andreas Bück, Evangelos Tsotsas

#7343

Effect of closed cycle modified atmosphere drying on characteristic of kiwi fruit during storage

Ihsan Burak Cam, Handan Basunal Gulmez, Emrah Eroglu, Ayhan Topuz

#7344

Improvement of pea protein isolate powder properties by agglomeration in a fluidized bed: comparison between binder solutions

R. F. Nascimento, K Andreola, J. G. Rosa, O. P. Tarantox

#7345

Influence of drying conditions on the acacia gum particle growth in fluidized bed agglomeration: in-line monitoring of particle size

Juliana G Rosa, R. F. Nascimento, K. Andreola, O. P. Taranto

#7346

Fluid bed agglomeration and drying of rice protein concentrate powder using grape pulp as binder: in-line monitoring of particle size

Osvadir Pereira Taranto, Kaciane Andreolla

#7347

Agglomeration of hydrolyzed collagen with blackberry pulp in a fluidized bed

Thayná R Viegas, Osvadir Pereira Taranto

#7348

Intermittent–microwave and convective drying of parsley.

Justyna Szadzińska, Dominik Mierzwa

#7349

Experimental investigation of drying and inactivation of baker's yeast in fluidized beds operated under reduced pressure

Sayali Zarekar, Andreas Bück, Michael Jacob, Evangelos Tsotsas

#7359

The evolution of pore structure during microwave freeze-drying of Chinese yam

Xu Duan

#7361

Influence of process conditions on quality of spouted bed dried okara

Gabriel Alves de Oliveira Scafi, Renan Alex Lazarin, Louise Emy Kurozawa

#7366



Effect of temperature and mode of drying on bioactive compounds and quality of germinated parboiled rice

Supaporn Klaykruayat, Busarakorn Mahayothee, Marcus Nagle, Joachim Müller

#7367

Comparison of different novel drying methods in terms of some process criteria

Murat Yanat, Taner Baysal

#7373

Theoretical study and case analysis for a pre-dried pyrolysis coupled lignite-fired power system

Rongtang Liu, Ming Liu, Junjie Yan

#7375

The effect of ohmic heating pretreatment on drying of apple

Naciye Kutlu, Merve Silanur Yilmaz, Hicran Arslan, Asli Isci, Ozge Sakiyan

#7379

Energy performance of an industrial superheated steam heat pump flash dryer for drying of bio-fuel

Roger J. I. Renström, H. Johansson-Cider, L. Brunzell

#7382

CT-studies during the Conditioning phase of the Wood Drying Process.

José Couceiro, Lars Hansson, Margot Sehlstedt-Persson, Dick Sandberg

#7397

Mechanistic analysis of spray drying encapsulation of polyphenols by maltodextrin: experimental and modeling approaches

Loucine Mekhitarian, Benjamin Sobac, Benoit Haut

#7403

Effect of a thermo ultrasonic pretreatment on the freeze-drying time and antioxidant characteristics of guava slices

Sebastian Ospina Corral, Diana L Manrique Lopéz, Carlos E Orrego Alzate

#7405

Spray drying of soymilk: evaluation of process yield and product quality

Bruna Delamain Fernandez Olmos, Camila Benedetti Penha, Louise Emy Kurozawa

#7409

The prediction model of moisture content's stabilization during tobacco strip drying process

Mingjian Zhang, Feng Huang, Le Wang, Yan Zhu, Haisheng Wang, Qimin Xu, Qing Chen, Bin Li, Bing Wang

#7430

Influence of intermittent and continuous microwave heating on drying kinetics and wood behavior of Eucalyptus Gomphocephala



Mariam Habouria, Sahbi Ouertani, Soufien Azzouz, Wahbi Jomaa, Mohamed Taher Elaib, Mohamed Afif Elcafci

#7450

Assessment of drying kinetics of complex formulations during convective thin film drying
Eline Both, Remko Boom, Maarten Schutyser

#7456

Drying of acerola residues in a roto-aerated dryer assisted by infrared heating
P.B. Silva, G. D. R. Nogueira, C. R. Duarte, Marcos A.S. Barrozo

#7457

Drying of microalga *Spirulina platensis* in a rotary dryer with inert bed.
D. N. C. Silva, T. C. Silva, A. O. Santos, I. S. Graton, C. R. Duarte, Marcos A.S. Barrozo

#7466

The effect of intermittent: microwave and fluidized bed drying on quality and energy consumption of buckwheat
Gülşah Kızılalp, Tuğçe Türkoğlu, Gülşah Çalışkan Koç, Safiye Nur Dirim

#7467

The intermittent drying of wheat by microwave and fluidized bed drying
Tuğçe Türkoğlu, Hale Baykal, Hira Yüksel, Gülşah Çalışkan Koç, Safiye Nur Dirim

#7472

Mechanistic modeling expedites the development of spray dried biologics
Nicholas B. Carrigy, Lu Liang, Hui Wang, Sam Kariuki, Tobi E. Nagel, Ian F. Connerton, Reinhard Vehring

#7476

Drying of moist food snacks with innovative slot jet reattachment nozzle
M. Farzad, M. Yang, J. S. Yagoobi, B. Tilley

#7482

Changing spray-dried lactose-whey protein isolate particle structure with drying conditions
Roger de Souza Lima, Gaëtan Gutierrez, Patricia Arlabosse, Maria-Inês Re

#7484

Pulsed Electric Fields (PEF) as pre-treatment for freeze-drying of plant tissues
Lubana Al-Sayed, Virginie Boy, Emmanuel Madieta, Emira Mehinagic, Jean-Louis Lanoisellé

#7524

Hot air drying characteristics and nutrients of apricot *armeniaca vulgaris lam* pretreated with Radio Frequency(RF)
M.C. Peng, J.X. Liu, Y. Lei, X.J. Yang, Z.H. Wu, X.L. Huang

#7525

Inclusions and ice growth during film freeze concentration of sucrose solutions



Jan-Eise Vuist, Martijn Van der Vis, Maarten Schutyser, Remko Boom

#7526

Quality analysis of fresh and dried mangoes

S. Arendt, K. Joedicke, W. Hofacker, W. Speckle

#7528

Experimental investigation and comparison of internal pressure in wood of willow *Salix viminalis* during convective drying in air and superheated steam

Robert Adamski

#7532

Salting kinetics, salt diffusivities and proximate composition in osmotically dehydrated Pirarucu muscle

Tiago Luís Barretto, Lilian Fachin Leonardo Betiol, Elisa Rafaella Bonadio Bellucci, Javier Telis-Romero, Andrea Carla da Silva Barretto

#7533

Influence of fat level reduction in the drying of Italian salami

Camila Vespuccio Bis Souza, Marise Rodrigues Pollonio, Ana Lúcia Barretto Penna, Andrea Carla da Silva Barretto

#7541

Process of parboiling rice by microwave-assisted hot air fluidized bed technique

S. Prachayawarakorn, E. Saniso, T. Swadisewi, S. Soponronnarit

#7542

Fine Particle Drying in a nonporous draft tube conical spouted bed with fountain confiner.

Mikel Tellabide, Idoia Estiati, Aitor Pablos, Haritz Altzibar, Martin Olazar

#7543

Modelling batch drying of fine sand in a fountain confined conical spouted bed

Aitor Pablos, Mikel Tellabide, I. Estiati, Jorge Vicente, Roberto Aguado, Martin Olazar

#7545

New options in particle design for high performance applications - Glatt's APPtec advanced pulse powder and high temperature fluidized bed technologies

Michael Jacob

#7549

Superheated steam drying: Drying characteristics of single particle and fluidized bed drying

Nelli Hampel

#7555

Study of the behavior of a multistage dryer provided with downcomer

Luis Verduzco Mora, Carlos Martínez Vera, Mario Vizcarra Mendoza

#7556



Strawberries hybrid drying combining airflow, die technology and intermittent microwaves.

Ezzeddine Amami, Colette Besombes, Nabil Kechaou, Karim Allaf

#7557

Bubble behavior of fructooligosaccharides syrup during the belt drying process

Lijuan Zhao, Dandan Wang, Tengfei Du, Junhong Yang, Jianguo Li, Zhonghua Wu

#7566

Investigation of spray agglomeration process in continuously operated horizontal fluidized bed

Jaijie Du

#7588

Analysis of particle formation during drying of very small droplets

Isabel Siemons, Remko Boom, Maarten Schutyser, Ruud Van Der Sman

#7590

Towards a novel strategy to increase probiotics survival after spray drying

Evelien Vaessen, Heidy den Besten, Remko Boom, Maarten Schutyser

#7611

Drying characteristics and water desorption isotherm of *Ulva* spp. using different drying methods

Elsa Uribe, Antonio Vega-Gálvez, Vivian García, Alexis Pasén, Gabriela Goñi Mail

#7620

Low-temperature vacuum drying (LTVD) of papayas (*Vasconcellea pubescens*): Drying characteristics and kinetics

Antonio Vega-Gálvez, Elsa Uribe, Macarena Vega, Alexis Pastén

#7626

Production of dry-cured pork loin using water vapour permeable bags

A. Fuentes, S. Verdú, C. Fuentes, R. Grau, J. M. Barat

#7627

Reducing sodium content in dry-cured pork loin. A novel process using water vapour permeable bags

A. Fuentes, S. Verdú, C. Fuentes, R. Grau, J. M. Barat

#7640

Influence of back mixing on the pilot-scale convective drying of sewage sludge: evolution of the volume and exchange surface

Jie Li

#7641

Study on the general dynamic model of biomass drying processes

Le Wang, Xu Li, Qiaoling Li, Duanfeng Lu, Bin Li, Wnkui Zhu, Mingjian Zhang, Ke Zhang, Nan Deng



#7660

Development of a CHES-FBD dryer for paddy rice

Adesoji Matthew Olaniyan, Adesola Adebajo Satimehin, Nonzo Dickson Ani

#7672

Evaluation of Izmir Tulum cheese pieces by drying with tray drier at different air flow rates and temperatures

Gulsah Kizilalp, Izel Polat, Müge Urgan, Nurcan Koca

#7673

Stability, microstructure and rheological characteristics of low-fat and full-fat cheese emulsion with different emulsifying salt concentration for production of spray-dried cheese powder

Müge Urgan, Sevcan Unluturk, Nurcan Koca

#7683

LNT microwave-multiphase transport model for the microwave drying of lignite thin layer

B. A. Fu, M. Chen, Q. H. Li

#7688

Combined drying technologies and the effect on the quality attributes of carambola slices (Averrhoa carambola L.)

Rosa I. Castillo

#7696

Description of atmospheric freeze-drying of brown seaweeds (Saccherina Latissima) with respect to thermal properties and phase transitions

Ignat Tolstorebrov, Trygve Magne Eikevik, Inna Petrova, Michael Bantle



Thursday, September 13th, 10:00-11:00

Poster Session: DRYING MODELLING I (Main hall 3P. Building)

#7239

Modeling of Particle Behavior in a Wurster Fluidized Bed: Coupling CFD-DEM with Monte Carlo
Zhaochen Jiang, Christian Rieck, Andreas Bück, Evangelos Tsotsas

#7274

CFD model-supported design of monodisperse co-current spray dryers
Maciej Jaskulski, Thi Thu Hang Tran, Evangelos Tsotsas

#7284

Pore network model of primary freeze drying
N. Vorhauer, P. Först, H. Schuchmann, E. Tsotsas

#7311

Moisture diffusion coefficient estimation in peas drying by means of a modified Hawlader and Uddin method
Carlos Martínez-Vera, Mario Vizcarra-Mendoza

#7315

Effect of gas invasion pattern on drying of porous media
Rui Wu

#7337

New model for the rehydration characteristics of white yam at different temperatures
A. A. Akinola, S. N. Ezeorah, E. P. Nwoko

#7341

Stochastic modeling of binder-less agglomeration in fluidized beds
Christian Rieck, Andreas Bück, Evangelos Tsotsas

#7351

Modelling drying kinetics of closed cycle modified atmosphere drying of banana fruit
Ihsan Burak Cam, Emrah Eroglu, Handan Basunal Gulmez, Ayhan Topuz, Can Ertekin

#7363

Heat and mass transfer properties evaluation from analytical solution of Luikov-modified equations
Saraí Vargas-González, Erik López-Sánchez, Guadalupe C. Rodríguez-Jimenes, Irving I. Ruiz-López, Miguel A Garcia-Alvarado

#7369

Optimization of spray drying of fruit juices with drying aids
Sebastian Linnenkugel



#7388

A pore-scale study on the drying kinetics and mechanical behavior of particle aggregates
T. S. Pham, B. Chareyre, E. Tsotsas, A. Kharaghani

#7389

Investigation of 3D particle flow in a flighted rotating drum
Lanyue Zhang, Fabian Weigler, Zhaochen Jiang, Vesselin Idakiev, Lothar Mörl, Jochen Mellmann, Evangelos Tsotsas

#7393

Thermo-economic analysis of an efficient lignite-fired power system integrated with flue gas fan mill pre-drying
Xiaoqu Han, Jiahuan Wang, Ming Liu, Sotirios Karellas, Junjie Yan

#7394

Mathematical modeling of the drying of a suspended colloidal drop
Benjamin Sobac, Pierre Colinet, Benoit Haut

#7395

Competition between capillary transport and evaporation in a porous medium
Charlotte Van Engeland, Benjamin Sobac, Laurent Spreutels, Robert Legros, Benoit Haut

#7406

Drying behavior, diffusion modeling of cuminum cyminum L. undergoing microwave-assisted fluidized bed drying
Atefe Babaki, Gholamreza Askari, Zahra Emamdjomeh

#7408

Model of the solutes transfer during osmotic dehydration of vegetal matrices: a proposal
Sahylin Muñiz-Becerá, Lilia Leticia Méndez-Lagunas, Juan Rodríguez-Ramírez, Sadoth Sandoval-Torres

#7410

Effect of partition wall on the performance of continuous fluidized bed dryer for lignite
Zhihong Liu

#7411

Three-dimensional measurement of internal structure in frozen food materials by cryogenic microtome spectral imaging system
Gabsoo Do, Sadanori Sase, Yeonghwan Bae, Tatsurou Maeda, Shigeaki Ueno, Tetsuya Araki

#7412

Dynamic optimization of the transmission efficiency between the solid state microwave sources and the microwave applicator
S. Zuber, M. Joss, S. Tresch, M. Kleingries

#7415



Discrete modeling of ion transport and crystallization in layered porous media during drying
A. Rahimi, T. Metzger, A. Kharaghani, E. Tsotsas

#7416

Simulation and control of a batch fluidized bed dryer

Bruno Worliczek de Camargo, Rodrigo Cesar Frizzi, Carlos Alexandre Moreira Silva, Bruno Faccini Santoro

#7417

Dependency of continuum model parameters on the spatially correlated pore structure studied by pore-network drying simulations

Xiang Lu, Abdolreza Kharaghani, Evangelos Tsotsas

#7421

Use of a multi-vial mathematical model to design freeze-drying cycles for pharmaceuticals at known risk of failure

Bernadette Scutellà, Ioan Cristian Trelea, Erwan Bourlés, Fernanda Fonseca, Stephanie Passot

#7422

Comparison between the finite differences, finite volume and finite element methods for the modelling of convective drying of fruit slices

Adriana María Castro, Edgar Yesid Mayorga, Fabian Leonardo Moreno

#7454

Experimental and numerical study of flighted rotating dryers: assessment of number of flights and granular material on the design loaded

Marcos A. S. Barrozo

#7455

The role of boundary conditions on the dynamics of green coffee beans in a rotated dryer

M.V.C. Machado, I.A. Resende, R.M. Lima, R.J. Brandão, M.R. Pivello, S.M. Nascimento, C.R. Duarte, Marcos A.S. Barrozo

#7464

Lattice Boltzmann modeling and simulation of isothermal drying of capillary porous media

Githin Tom Zachariah, Debashis Panda, Vikranth Kumar Surasani

#7471

Air impingement drying of foods: modelling and experimental approach

Tidjani Bahar, Virginie Boy, Yves Lemée, Anthony Magueresse, Thomas Lendormi, Patrick Glouannec, Jean-Louis Lanoisellé

#7475

Drying kinetics of cellulose nanofibers suspensions

Belal Al Zaitone

#7491



Evaluation of color change and browning index values in bananas dried under modified atmosphere by computer vision technique

Ihsan Burak Cam, Handan Basunal Gulmez, Ayhan Topuz

#7497

Convective air drying of brown seaweed *Bifurcaria bifurcata* in thin layer configuration

Santiago Arufe-Vilas, Jorge Sineiro, Francisco Chenlo, Ramón Moreira

#7498

Microwave drying of food materials modeled using the reaction engineering approach (REA): lumped and spatial model

Aditya Putranto, Xiao Dong Chen

#7505

Single droplet drying of detergents. experimentation & modeling

Borja Hernandez, Luis Martin de Juan, Mariano Martin, J. Enrique Julia, Rosa Mondragon, Leonor Hernandez, Juan Carlos Jarque, Sergio Chiva

#7506

Global sensitivity analysis of operating conditions on the convective drying of paddy rice

Henry Vaquiro, Jader Rodríguez-Cortina, Oscar Rodríguez-Barragán, Susana Simal, José Bon

#7521

Hybrid solar-gas-electric dryer optimization with genetic algorithms

H. El Ferouali, M. Gharafi, A. Zoukit, S. Doubabi, N. Abdenouri

#7523

Multivariable modeling of an innovative hybrid solar-gas dryer

A. Zoukit, H. Elferouali, I. Salhi, S. Doubabi, N. Abdenouri

#7527

Identification of moisture transport mechanism in gypsum during convective drying

R. Adamski, A. Adamska, Z. Pakowski

#7534

Numerical and experimental study of a modular solar dryer coupled to a parabolic trough solar concentrator for agricultural product

Noureddine Benaouda

#7538

Inline quality control of product properties produced using fluidized bed agglomeration

Michael Jacob

#7539

Simulation of a Fluidized Bed Characteristics using DEM-CFD Coupling

Preeda Prakotmak



#7548

Thermal properties of dried cranberry fruits
Marek Markowski, Magdalena Zielinska

#7553

Modeling of kinetics of drying process of polycaproamide granules considering its sorption properties
Maria Konstantinovna Kosheleva, Olga Roaldovna Dorniyak, Marina Sergeevna Maklusova

#7563

Computational fluid dynamics simulation of spray dryers: transient or steady state simulation?
S. Afshar, H. Jubaer, B. Chen, J. Xiao, X. D. Chen, M. W. Woo

#7571

Semi empirical models for drying of agricultural products by used structured artificial neural network
Kornél Bessenyei, Zoltán Kurják, János Beke

#7574

Drying characteristics and kinetics of hybrid tomato (EVA-F1) using different drying methods
Olajide Sobukola

#7575

Numerical simulation of evaporation of heptane droplet as a precursor material to form wax complexes in a single droplet drying (SDD) by suspension method
Oluwafemi Ayodele George

#7578

Artificial intelligence techniques modeling for predicting moisture content of luffa slices during air impingement drying process
Liu Ziliang, Deng Li-Zhen, Wang Jun, Gao Zhen-Jiang, Liu Yan-Hong, Xiao Hong-Wei

#7584

Experimental and numerical studies of the drying of aqueous solvent polymer supported by a thin polymer film
Pascal Le Bideau, Patrick Glouannec, Anthony Magueresse

#7585

Estimation of kinetics parameters in forced convection drying with Markov Chain Monte Carlo method
H. R. B. Orlande, N. Gnanasekaran, M. V. De Bonis, G. Ruocco

#7596

Rotary wheel atomizer study using computational fluid dynamics, analytical solutions and full-scale testing



Tórstein Vincent Joensen, Maximilian Kuhnenn, Mads Reck, Cameron Tropea

#7598

Mathematical model of heat and mass transfer during drying of food material with shrinkage effect incorporated

I. O. Ajiboshin, O. A. Olafadehan, R. A. Bello

#7606

Application of process analytical technologies and artificial intelligence to monitor and control a fluidized bed coating process

C. A. M. da Silva, O. P. Taranto

#7614

Mathematical modeling of thin-layer drying of longan in hot air tunnel

Bhuchiss Tanwanichkul

#7623

The parametric problem of enhanced multiphysics drying by time scale comparison

Francesco Marra, Gianpaolo Ruocco, Giuseppe Titomanlio

#7646

Image Segmentation and 3D reconstruction for improved prediction of the sublimation rate during freeze drying

Luigi C Capozzi, Andrea Arsiccio, Amelia C Sparavigna, Roberto Pisano, Antonello A Barresi

#7658

Mathematical relationship between glass transition temperature and water activity of cellular and non-cellular food systems

Thanh Khuong Nguyen, Seddik khalloufi, Cristina Ratti

#7659

Mathematical approach and its experimental validation to predict the porosity profiles during drying

Seddik khalloufi

#7668

Modeling sorption isotherms and isosteric heat of sorption of roasted coffee beans

Gentil Andres Collazos-Escobar, Nelson Gutiérrez-Guzmán, Henry Alexander Vaquiro-Herrera, Erika Tatiana Cortes-Macias

#7669

Modelling the Water Sorption Isotherms of Warionia Saharæ and determination of sorption heats and drying kinetics

F. Amel, A. Cheriti

#7681

Multiphase transport model for microwave freeze-drying of porous media with prebuilt pores



Wei Wang

#7682

Hybrid cylinder dryer for the drying of sheet-form materials with hot air
Sung Il Kim, Sang Hyun Oh, Won Pyo Chun, Ki Ho Park, Byoung Hyuk Yu

#7702

Thermodynamic properties and moisture sorption isotherms of two pharmaceutical compounds
A. Zammouri, M. Ben Zid, N. Kechaou, N. B. Mihoub

#7703

Comparison between bubbling and turbulent regime for the simulation of batch pharmaceutical powders fluidized bed drying
A. Zammouri, N. B. Mihoubi, N. Kechaou

#7704

CFD modelling of particle residence time in spray drying towers
Borja Hernandez, Luis Martin de Juan, Mariano Martin, Victor Francia

#7712

Multi-area temperature and humidity independent control of belt dryer
Xianlong Yu

#7715

Modeling and simulation of intermittent drying of high moisture foods
Ana Paula Filippin, Érika Fernanda Rezendes Tada, João Claudio Thomeo, Maria Aparecida Mauro

#7726

The aggregation rate constant of the discrete population balance model in hot melt fluidized bed coating process
W. Xin, Y. Yan, X. Qing, W. Long

#7733

Study of the hot air drying process of chicken breast by non-invasive techniques
Juan Angel Tomas-Egea, Marta Castro-Giraldez, R.J. Colom,, Pedro J Fito

#7737

Intensification of the convective drying process of *Salvia Officinalis*: simulation and optimization
José Bon, Jebri Monia, José Tarrazó, Susana Simal, Gabriela Clemente



Thursday, September 13th, 16:30-18:30

Poster Session: DRYING MODELLING II AND PROCESS II (Main hall 3P. Building)

#7752

Thermodynamic and spectrophotometric study of tiger nut pasta

Marta Castro-Giráldez, María Eugenia Martín-Esparza, Ana Albors, Pedro J. Fito

#7755

Pulsed multiphase flows - Investigation of the influence of flow conditions and particle properties on the heat transfer in gas-solid flows

Arne Teiwes, Michael Jacob, Maksym Dosta, Stefan Heinrich

#7763

Control of fluid-dynamic regime in spouted bed wetting process using spectral analysis

J. J. Butzge, C. A. M. da Silva, O. P. Taranto

#7767

Flat plate solar air heater with helical integrated fins for drying processes

Maytham A. Al-Neama, Istvan Farkas

#7812

Modelling of amorphous to crystalline transformation in a drying droplet/particle

Muzammil Ali

#7820

Theoretical analysis of HPD for performance optimization

Bhaskar Thorat

#7825

Use of hemispherical-shell geometry to describe the osmotic dehydration of white mushroom considering its shrinkage

Irving Israel Ruiz-López, Julio Emmanuel González-Pérez, Karen Hariantty Estévez-Sánchez,

Juan José Luna-Guevara, Carlos Enrique Ochoa-Velasco

#7827

Drying of sugarcane bagasse in a partially filled horizontal drum

Érika Fernanda Rezendes Tada, Andreas Bück, Fernanda Perpétua Casciotori, João Cláudio Thoméo

#7841

Moisture content modeling and effective moisture diffusivity determination during convective solar drying of blackberry (*rubus spp*) and basil (*Ocimum basilicum L.*)

Anabel López-Ortiz, Octavio García-Valladares, Isaac Pilatowsky-Figueroa, Juan Rodríguez-Ramírez

#7847



Drying characteristics and mathematical modelling of the drying kinetics of oyster mushroom (*Pleurotus ostreatus*)

A. A. Satimehin, M. O. Oluwamukomi, V. N. Enujiugha, M. Bello

#7857

Mass transfer modeling during convective drying of white mushroom pilei using the prolate-spheroidal coordinate system

Irving Israel Ruiz-López, Julio Emmanuel González-Pérez, Karen Hariantty Estévez-Sánchez, Carlos Enrique Ochoa-Velasco

#7877

Thermodynamic model of Ca(II)-alginate beads drying by spectrophotometry

Patricio R. Santagapita, Marta Castro-Giraldez, Maria Victoria Traffano-Schiffo, Pedro J Fito

#7882

Development and use of three-dimensional image analysis algorithms to evaluate puffing of banana slices undergone combined hot air and microwave drying

A. Satiengkijumpai, M. Jinorose, S. Devahastin

#7884

On the importance of heat and mass transfer coupling during characterization of hygroscopic insulation materials

Patrick Perre, Arnaud Challansonnex

#7885

A physical interpretation of the use of fractional operators for modelling the drying process

Patrick Perre, Ian Turner

#8266

Designing an effective and optimized freeze-drying process for complex pharmaceutical formulations using "Temperature-Ramp" approach

Getachew Assegehegn, Edmundo Brito-de la Fuente, José María Franco Gómez² Franco, Crispulo Gallegos

#8350

Theoretical and experimental investigation of temperature and moisture distributions and changes in nutritional quality during Intermittent Microwave

Imran Khan, Nghia Duc Pham, Azharul Karim

#8353

Diffusion in organic double layer coatings

Sebastian Marius Raupp, Paul Kitz, David Siebel, Philip Scharfer, Wilhelm Schabel, Frank Kleine-Jäger

#8366

Temperature profiles in model food cylinders during microwave-vacuum heating



Nazmi İzli, Sundaram Gunasekaran, Ahmet Polat

#8545

Mathematical modelling of fluidised bed for drying heat sensitive compounds
Behdad Soltani, Timothy A.G. Langrish, John M. Kavanagh

#7697

Description of atmospheric freeze-drying process of organic apples using thermo-physical properties
Ignat Tolstorebrov, Trygve Magne Eikevik, Inna Petrova, Yulia Shokina, Michael Bantle

#7708

Exploring drying conditions for Mexican mesquite pods (*Prosopis laevigata*)
S. S. Torres, D. López, J. Rodríguez, L. Mendez, L. V. Aquino

#7711

Effects of thermal intermittence on fruit characteristics and drying time in convective drying of mango (*Mangifera indica* L.)
Laís Ravazzi Amado, Keila Souza Silva, Maria Aparecida Mauro

#7718

Modelling the drying kinetics of sucrose droplets with different initial concentrations using the Reaction Engineering Approach (REA)
Nan Fu

#7720

Development of cost-effective protocol for preparation of dehydrated paneer (Indian cottage cheese) using freeze drying
S. S., P. H. Nema, N. Emanuel, S. Singha

#7721

The effect of different wall materials on the production of suppressed-pungent capsaicin microparticles
Emine Varhan, Zehra Kasımoğlu, Mehmet Koç, Hilal Şahin Nadeem

#7728

Microbial load reduction using modified Solar Conduction Dryer with composite filters
P. Jadhav, S. Ashokkumar, N. Nagwekar, B. Thorat

#7729

Pressure drop characteristics of adjustable slotted distributor in fluidized bed
T. Zhao, C. Liu, Q. Xu, Z. Li, W. Juan

#7734

Coating effect of micro-sized droplets impacting on low temperature spherical particles
Xiusheng Wu, Xiaoyu Ma, Qing Xu, Zhanyong Li, Ruifang Wang

#7735



Superheated steam spray drying for food applications - a feasibility study
Tobias Balke, Reinhard Kohlus

#7736

Hybrid and intermittent drying of carrot (*Daucus carota* var. Nantes)
Justyna Szadzińska, Dominik Mierzwa, Krzysztof Bukowski

#7740

Determination and modelling of the particle size dependent residence time distribution in a pilot plant spray dryer
Nora Alina Ruprecht, Reinhard Kohlus

#7749

Application of microwaves in the convective drying of ceramic
Kinga Rajewska, Andrzej Pawłowski

#7751

The effect of the different drying techniques on the antioxidant activity of orange peel
Canan Kartal, Gamze Sonkaya, Aygün Şanlı, Büşra Çakaloğlu, Semih Ötleş

#7754

Optimization of drying condition of instant matooke chips
John Bosco Kawongolo

#7761

Drying of algae by various drying methods
Bhaumik Bheda, Manoj Shinde, Rajaram Ghadge, Bhaskar Thorat

#7768

Morphology evolution during single droplet drying of hydroxypropyl methylcellulose at high temperatures
Wael Ahmed Mohammed Ebrahim, Andrew Bayly

#7772

The influence of ethanol on the convective drying and on the nutritional quality of dekopon slices
Ronaldo Elias de Mello-Júnior, Nathane Silva Resende, Jefferson Luiz Gomes Corrêa, Leila Aparecida Salles Pio, Elisângela Elena Nunes Carvalho

#7775

Influence of drying on the recovery of phosphorus from wastewater sludge.
Laurent Fraikin, Zaheer Shariff, Andreas Pfennig, Angélique Léonard

#7781

Drying of *Murraya koenigii* leaves using microwave heating and moisture-volatiles condensation
Om Prakash Suryawanshi

#7782



Improving bioaccessibility of bioactive compounds in beetroot (*Beta vulgaris*) through drying

Maria Esperanza Dalmau, Carme Molinas, Gustavo Barrera, Antoni Femenia

#7787

Osmotic dehydration of eggplant, carrot and beetroot slices: Effect of vacuum on phenolic acid composition

João Renato de Jesus Junqueira, Jefferson Luiz Gomes Corrêa, Kamilla Soares de Mendonça, Ronaldo Elias Mello-Júnior, Lucas Barreto de Carvalho

#7790

Drying characteristics of wastewater sludge according to outside air inflow conditions.

Sang Hyun Oh, Ki Ho Park, Byoung Hyuk Yu, Sung Il Kim

#7792

Impact of processing temperature on drying behavior and quality changes in organic beef
Gardis J.E. Von Gersdorff, Luna Shrestha, Sharvari Raut, Stefanie K. Retz, Oliver Hensel, Barbara Sturm

#7798

Thermal - Vacuum dehydration and dispergation of dispersed materials

Volodymyr Alexandrovich Kutovyi, Victor Tkachenko, Alice Nikolaenko

#7804

Development of polyphenols-enriched maple sugars by freeze- and vacuum drum drying technologies

Sagar Bhatta, Tatjana Stevanovic, Cristina Ratti

#7807

Effect of incorporation of blackberry particles obtained by freeze drying on physicochemical properties of edible films

Gislaine Ferreira Nogueira, Farayde Matta Fakhouri, Rafael Augustus de Oliveira

#7809

Investigation of spray agglomeration process in continuously operated horizontal fluidized bed

J. Du, A. Bück, E. Tsotsas

#7819

Agglomeration of spray dried spinach juices powder: powder properties

Gülşah Çalışkan Koç, Safiye Nur Dirim, Hira Yüksel Mail

#7821

Fluidised bed agglomeration of black carrot juice powders

Safiye Nur Dirim, Hira Yüksel, Gülşah Çalışkan Koç

#7822



Finish drying and surface sterilization of bay leaves by microwaves
Ashish Kapoor, Parag Prakash Sutar

#7826

Moisture sorption characteristics of pistachio
Banu Koç, Gamze Atar, Nazan Çağlar

#7831

Drying kinetics and quality attributes of fruit and vegetable pomace dehydrated by different methods.
Malwina Siudek, Adam Figiel, Anna Michalska, Krzysztof Lech, Aneta Wojdyło

#7835

Counter current spray drying of sugar rich food
Yongmei Sun, David Kannar, Bernard Chen, Meng Wai Woo

#7837

Different methods of drying and extraction for utilization of hemp seeds pomace
Klaudia Urbanska, Joanna Majerska, Adam Figiel, Anna Michalska, Krzysztof Lech, Aneta Wojdyło

#7839

Drying of particle polymer composite films – an experimental and simulation study on particle-polymer and porous battery electrode films
Wilhelm Schabel

#7850

Influence of ultrasound assist during combined drying on ceramic materials quality and drying kinetics
Andrzej Pawłowski, Weronika Trawińska

#7852

Microencapsulation of passion fruit extract (*Passiflora biflora*) by spray drying
Daniela Aguilar, Olivia Rodriguez, Guadalupe Luna, Gregorio Zarate, Licet Bello

#7854

Microwave drying in fluidized bed to dehydrate microencapsulated *Saccharomyces cerevisiae* cells. Temperature control strategies
J. Mardaras, J. I. Lombraña, M. C. Villarán

#7889

Influence of the temperature and ultrasound application in drying kinetics of apple skin
Matheus P. Martins, Edgar J. Cortés, Carmen Rosselló, Ramón Peña, Juan A. Cárcel

#7961

Drying intensification by vibration: fundamental study of liquid water inside a pore
Wangshu Chen, Julien Colin, Joel Casalinho, Mohamed El Amine Ben Amara, Moncef Stambouli, Patrick Perré



#8270

Wall deposition experiments in a new spray dryer

X. Huang, C. Zhong, T. A. G. Langrish

#8281

Usage of emerging pre-treatment technologies in food drying

Senem Suna, Nihal Türkmen, Ömer Utku Çopur

#8365

Drying kinetics and selected physico - chemical properties of fresh cranberries preserved with microwave – vacuum process

Jan Piecko, Dorota Konopacka, Monika Mieszczakowska-Fraç, Dorota Kruczyńska, Karolina Celejewska

#8369

Influence of drying technique on physicochemical properties of bimodal meso-macropore structure of silica support

Noppadol Panchan, Chalida Niamnuy, Thanaphat Chukeaw, Anusorn Seubsai, Sakamon Devahastin, Metta Chareonpanich

#8533

Superheated Steam Dryer application for drying of sticky and pastry materials – particluar referens to distillers wet grain and solubles (DWGS).

Prem Verma, Himart Suneb, Weis Aaron



Friday, September 14th, 11:15-12:15

Poster Session: DRYING PRODUCTS II AND ENVIRONMENT I (Main hall 3P. Building)

#7789

Study on drying-induced cracking of rice kernel using acoustic emission method

Zhonghua Wu

#7800

Intensification of low-temperature drying of mushrooms by means of power ultrasound

Francisca Vallespir, Cristina Reche, Laura Crescenzo, Francesco Marra, Carmen Rossello

#7803

Vitamin C content of freeze dried pequi (*Caryocar brasiliense* Camb.) pulp

C. T. Soares, F. G. Nogueira, A. A. Santana, R. A. Oliveira

#7808

Effect of spray drying on volatile compounds of acerola pulp

P. M. Nogueira, M. T. Leite Neta, H. C. S. Araújo, M. S. Jesus, S. Shanmugam, N. Narain

#7811

Aroma retention during drying of caja-umbu fruit pulp

Anderson Santos Fontes, Maria Terezinha Santos Leite-Neta, Patricia Nogueira Matos, Hannah Caroline Santos Araújo, Monica Silva Jesus, G. Rajkumar, Narendra Narain

#7815

Blackberry pulp microencapsulation with arrowroot starch and gum arabic mixture by spray drying and freeze drying

Gislaine Ferreira Nogueira, Farayde Matta Fakhouri, Rafael Augustus de Oliveira

#7817

Study of drying and cooking stages to obtain fast cooking senia rice

Maria Dolores Ortola

#7830

Drying conditions and analysis of physicochemical characteristics of *Capsicum pubescens*

Consuelo Sánchez-García, Óscar Andrés Del Ángel-Coronel, Ingrid Paniagua-Martínez, Guadalupe Luna-Solano, Alejandra Ramírez-Martínez

#7832

Quantitative changes of polyphenolics and antioxidant capacity in plum by-product powders caused by different drying techniques

Joanna Majerska

#7834

Functional properties of dried tarragon affected by drying method

Banu Koç, Nazan Çağlar, Gamze Atar

#7843

Effect of the solar dehydration on the antioxidant capacity and the content of flavonoids of the blackberry pulp (*rubus* spp)



Azucena Silva-Norman, Anabel López-Ortiz, Isaac Pilatowsky-Figueroa, Octavio García-Valladares

#7844

Long-term maintenance of dried acellular matrices

Alessandro Zambon, Giovanni Giobbe, Massimo Vetralla, Filippo Michelino, Luca Ubani, Maria Pantano, Nicola Pugno, Paolo De Coppi, Nicola Elvassore, Sara Spilimbergo

#7845

Physical properties of novel cranberry powders composed of by-products and fruits

Anna Michalska

#7853

Experimental and numerical study of the drying of aromatic herbs

Hedi Romdhana, Ahlem Soltani, Soufien Azzouz, Afif Elcafsi

#7856

Studies on drying of spurilina using convective process assisted by capillary drainage

Hassini Lamine

#7859

Spray dried proliposomes of Rosmarinus officinalis polyphenols: a quality by design approach

Victor Oloruntoba Bankole, Claudia Regina F. Souza, Wanderley Pereira Oliveira

#7860

The drying and rehydration process of chayote (*Sechium edule*)

Alejandra Álvarez-Morales, Guadalupe Luna-Solano, Alejandra Ramírez-Martínez

#7861

Drying parameters influence on 'Ameclya' *Opuntia ficus* prickly pear oil quality

L. Hassini, H. Desmorieux

#7871

Generation of high drug loading amorphous solid dispersions by Spray Drying

Bhianca Lins de Azevedo Costa, Martial Sauceau, Romain Sescousse, Maria Ines Re

#7879

Effect of particle size of blueberry pomace powder on its properties

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