

THE WAVE



The newsletter publication of the International Microwave Power Institute

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Letter from the President

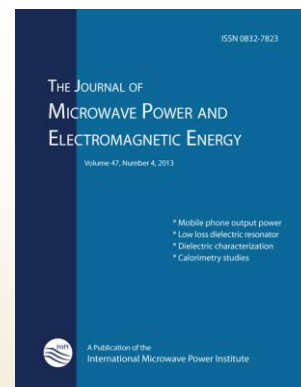
by Bob Schiffmann

Welcome to 2014! I know that many of you have been suffering under heavy snow and bitter cold, but remember that Spring is only about 2 1/2 months away (and the trout-fishing season opens shortly after that, on April 1).

I want to fill you in on some of the very good things that happened during 2013, and take a brief look ahead to what will be happening this year.

- Financially, IMPI is in very good shape: we have managed to retire one of our 2 large debts, and reduce the other to approximately a quarter of what was; and, we have about \$70,000 in the bank. Our accountant, Neil Suffa, is delighted with our progress.
- After many delays and problems, the new IMPI website is on track to be launched any day now, and within the next month the Journal Microwave Power & Electromagnetic Engineering will be password-protected, meaning that only paid-up IMPI Members and subscribing libraries will have access to full papers.
- IMPI put on two successful events last year: IMPI 47 in Providence, RI and the Fall Short Course in Omaha, NE.
- JMPEE: 2013 saw the publication of volume 47, and a significant income from past-due libraries. Our Editor-in-Chief, Juan Aguilar-Garib, and the reviewers have done a wonderful job maintaining the high quality of the Journal, while keeping to the exacting publication schedule.
- Memberships remain strong, with 5 Corporate Members for the year.
- We continue to publish "The Wave Newsletter" with 6 issues in 2013 and very positive feedback from its readers.

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Volume 47 (2013) of the Journal of Microwave Power and Electromagnetic Energy was published online the end of December 2013. All IMPI members receive a complimentary copy of the Journal which can be downloaded at www.jmpee.org. If you are interested in purchasing a print copy for your library, the special price for Members is \$100 and this includes the shipping cost. Email molly.poisant@impi.org by January 20 to reserve a copy; they will ship in early February. We also have past Volumes of the Journal available for purchase (also \$100). The new and improved JMPEE website is in final production. Look for an email the end of this month with your new JMPEE login and password.

Meet the Member: Ric Gonzalez



Ric Gonzalez of ConAgra Foods is the newest member of IMPI's Executive Committee. In June 2013, Ric was voted in as a member of the Board of Governors and subsequently appointed as Secretary of the Executive Committee. Ric also served as the co-chair of the 2013 Fall Short Course. He joined IMPI in 2010.

Ric works in Innovation within the R&D organization at the ConAgra Foods, Inc. headquarters in Omaha, NE. He is a Senior Principal Research Scientist and the Director of Physical and Material Sciences. His role is to lead the core hard science group in the physical and chemical characterization of food and packaging materials and innovation of material technologies for application to the improvement of current products and the development of new packaged foods, including microwavable food products.

Ric has a B.A. in Sociology and Anthropology from Sangamon State University, B.S. in Chemistry from the University of Illinois and Ph.D. in Analytical Chemistry from the University of Arizona. Areas of expertise include separation science, mass spectrometry, spectroscopy, chemistry of materials and microwave heating. He is also a member of the American Chemical Society (ACS) and the Institute of Food Technologists (IFT).

When asked about the benefits of IMPI, Ric had the following to say, "IMPI provides ConAgra Foods (myself included) membership and access to the world's foremost expertise and scientific community in microwave and RF heating of materials, particularly food materials."

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Letter from The President *cont.*

As to 2014:

- IMPI 48 will be held June 18–20 in New Orleans and presentation submissions are arriving daily. The Technical Program Chair for this symposium is Professor Ray Boxman of Tel Aviv University. He has selected an outstanding Technical Program Committee and we expect an excellent program. Also, Molly is working on our enjoying the best New Orleans has to offer.
- We are also making plans to hold one or 2 webinars this Spring dealing with various technical issues regarding microwave heating, ovens and/or industrial applications. These will be offered free to all IMPI members. This is the first time we are doing this so we are likely to suffer some "growing pains".
- Finally, we will begin planning for the Fall Short Course very soon. We are hoping it will be hosted by one of our Corporate Member companies, and we invite all of you to assist in putting together an outstanding program.

We are all very happy to see the progress that IMPI is making on all fronts. I want to thank all of you who have contributed to this effort, and a special thanks to our Corporate Members, whose continuing support is very important to the Institute. I wish you all the best for this New Year. Stay warm!

Bob



Ask The Expert

Response provided by Dr. Sohan Birla, Principal Research Scientist, Breakthrough Science/Innovation/RQI, ConAgra Foods

How does salt content affect MW heating performance of food items ?

Microwave (MW) heating of materials is attributed to both rotation of dipolar molecules (water) and movement of ions. Increasing salt content increases the ionic heating contributions. Salt ions depress the dielectric constant (ϵ') and elevate the dielectric loss factor (ϵ'') compared to the response of pure water to 2.45 GHz MW radiation. The depression of ϵ' results from the binding of free water molecules by anions and cations of dissolved salts while the elevation of ϵ'' results from the addition of the conductive charge carriers.

MW heat generation (Q) is mathematically expressed as:

$$Q = 2\pi f \epsilon_0 \epsilon'' E^2$$

where:

f is the frequency, Hz

ϵ_0 is the free space permittivity, F/m

E is the electric field strength, V/m.

Based on the above equation, a common misconception is that the higher the loss factor, the faster the MW heating rate will be. In this equation the dielectric constant is not apparent; however, it directly affects the magnitude of the electric field strength with a given MW power input. The loss factor of the material also affects the magnitude of the electric field strength as MW energy penetrates the surface of the material. In a relatively large-sized sample loaded with salt, most of MW energy is dissipated at the surface as the penetration depth of the MW energy is very small in a material with a high dielectric loss factor (or "lossy" material). Therefore, salt content can be used for managing MW energy distribution within food products.



IMPI 48 Call for Papers Deadline Extended: February 3, 2014



Dear Colleagues,

In response to requests from colleagues, we are extending the deadline for submissions to the Symposium to February 3, 2014. Further details, including links to the [Call for Papers and a submission template](#), may be found on the IMPI website. Preferably submissions should be in the form of a 4-page paper following this template and instructions. However, we will consider shorter abstracts and extended abstracts in formulating the conference program. The Symposium Proceedings, however, will only be comprised of these four page papers, which will be reviewed by members of the Technical Program Committee. If you do not submit a four page paper by February 3rd, you must do so by February 17th for it to be included in the Proceedings.

With the hope of seeing you in New Orleans and best regards,

Ray Boxman
Chairman, Technical Program Committee
IMPI-48

View the Call for Papers and Author template [here](#). We are seeking submissions in the following categories:

FUNDAMENTALS AND INDUSTRIAL APPLICATIONS

- Microwaves and Materials – Dielectrics & Metals
- Modeling, CAD and Optimization
- Industrial High Power Equipment and Process Control
- New (Non-Communication) Microwave Technologies
- Microwave Enhanced Chemistry
- Microwave Plasma
- Materials Properties

FOOD SCIENCE AND TECHNOLOGY

- Product development and testing
- Product validation
- Microwavable packaging
- Microwave ovens: design, standards, safety
- Microbiological testing
- Industrial RF & microwave processing of food
- Biological applications

Registration will open on February 3rd. Please plan to attend and share the details of IMPI 48 with your colleagues. Additional details on IMPI 48 can be viewed [here](#).

Meet the Member: Ric Gonzalez *Continued*

“This powerful network, which integrates academia, government and industry, allows my colleagues and I to stay informed of the latest advancements and issues affecting the microwaveable food industry. The IMPI organization provides us with key knowledge needed to preserve and maintain the highest standards in food safety and quality, and provides a forum for the food industry to align on best practices.”

Ric and his wife Susan own a horse stables business and five of their own horses. They love to ride their horses, spend time with their dogs and many other animals, and are avid travelers and scuba divers, as well.

Calendar of Events

48th Annual Microwave Power Symposium (IMPI 48), June 18-20, 2014 at the Doubletree Hotel, Downtown New Orleans, Louisiana, USA. www.impi.org

IFT 14, Annual Food Meeting and Expo, June 21-24, 2014 at the New Orleans Morial Convention Center, New Orleans, Louisiana, USA www.ift.org

Do you have an upcoming event for us to list here? Email molly.poisant@impi.org for inclusion.

Ben Wilson Resigns from IMPI Board

Longtime IMPI Board and Executive Committee member Ben Wilson has resigned from both positions due to a change in employment. Ben has been an outstanding member of both bodies and a significant contributor as an IMPI Member to many of the Institute's activities. He has devoted a great deal of energy to ensuring IMPI's fiscal and organizational health. Among other things Ben has also chaired Nominations Committees, served as Session Chairs, and presented papers at several IMPI symposia.

On a personal note, Ben has been invaluable as our Executive Vice President and provided tremendous support and excellent advice to both Molly Poisant and me. We'll all miss Ben's IMPI involvement and his sunny disposition. We wish all the best in his new position.

"American Hustle" Doesn't Get Its Microwave Facts Right

by Bob Schiffmann, R.F. Schiffmann Associates Inc.

In the recently released film "American Hustle" which takes place in the 1980s, the housewife (played by Jennifer Lawrence) gets a brand-new Amana RadarRange and is warned not to put metal in it. But, she does: an aluminum foil tray with aluminum foil on top of it. When the oven is turned on, there is an explosion and fire. Defending herself to her husband she then tells him that she read an article by Paul Brodeur saying that a microwave oven "takes all of the nutrition out of food".

There are 2 things wrong with this:

1. Microwaving a food containing aluminum tray with aluminum foil on top of it will not cause an explosion or a fire, unless of course there is paper or another flammable substance present that can ignite from any arcing that will occur at the aluminum interfaces. To read my full interview in National Geographic [click here](#).
2. Paul Brodeur, a retired staff writer for the New Yorker wrote extensively about microwave radiation, stated in the Huffington Post, "this is a serious era. I have never written ... or declared in any way that a microwave oven does any such thing. Indeed, I have publicly stated the opposite." Read the full article [here](#).

We Need You!

IMPI is, at its core, a volunteer driven association. This year, more than ever, we need you, our IMPI members, to take a more active role in our organization. Please consider doing one or more of the following this year:

- Volunteer to sit on a program committee for the Symposium or Fall Short Course (time commitment is minimal – on average 2 hours a month)
- Contribute content for our Newsletter. Specifically, we are looking for information on current research and initiatives, awards/recognitions you or your organization received, and Ask the Expert questions.
- Attend the Programs. Make a commitment now to attend IMPI 48 in New Orleans and/or our Fall Short Course (October 2014 –location TBD).
- Encourage your colleagues to join IMPI!

For more ways to get involved, contact molly.poisant@impi.org or any member of the IMPI Board of Governors. We appreciate your support!

INTERACTIVE IMPI Direct links to Microwave News on the Web

Report on the [Global Microwave Oven Market](#)

Read about the [Raspberry Pi Microwave](#)

Camden BRI (UK) issues a white paper [describing the microwave reheating](#) of foods including a discussion on product development



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