



# The Chemical Consultant

Association of Consulting Chemists and Chemical Engineers, Inc.

*Scientific, Engineering, Business & Management Consultants*

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January—June, 2016

## FUTURE MEETINGS

To Be Announced

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## ABOUT THE ASSOCIATION

The Association of Consulting Chemists & Chemical Engineers (ACC&CE) is a network of senior-level consultants with a broad range of functional expertise and many years of experience in the chemical and allied industries.

The purposes of the organization are:

To offer prospective clients a “clearing house” which they can use to find the most qualified consultants or team of consultants whatever their particular problem may be.

To furnish support to its members as they conduct their consulting practices.

This newsletter is intended to support those purposes as well as to educate prospective new members and prospective client organizations about ACC&CE, and how we can be most helpful to them.

The ACC&CE has an interactive website – [www.chemconsult.org](http://www.chemconsult.org), that allows prospective clients either to input their problem or to search for those consultants most skilled in their area of concern.

## IN THIS ISSUE

This newsletter begins as usual with a letter from the President. David Manuta, which appears on pages 2 and 3. We have a short letter on page 4 from the Executive Director, John Bonacci who is recovering from a series of illnesses. He plans to retire from this position at the annual meeting in October, 2016. Also on page 4 is a message from your editor.

On page 5, Bernie Ennis will describe our progress in getting our meetings and presentations on line and available to all members. On page 6, we have the name and contact information on our newest member, Masatake Fushijima, and on pages 8-10 appears an article by member, Marvin DeTar.

We welcome comments from our readers and hope to receive articles of interest to add to future newsletters. Please send them to: [jvprii@jvporcelli.com](mailto:jvprii@jvporcelli.com).

## LETTER FROM THE PRESIDENT

**Dr. David M. Manuta, (Certificate #882), President of ACC&CE**

The old Bob Dylan song, "The Times They Are A Changin'", seems appropriate for the transition that the ACC&CE is presently going through.

This is every bit the transition that occurred when I purchased an IBM PS1 back in the 1980s. For nearly \$3,000, I purchased a device with perhaps 20 KB of ROM memory. Tiny, inexpensive devices today contain many times the 20 KB in RAM memory. A few years later, my IT provider sold me an Internet-ready computer. After my resistance was sufficiently lowered, I allowed myself the luxury of a cellular (now wireless) telephone and a laptop computer. [While I was dragged kicking and screaming to these new technologies, I now wonder how I got along without these devices.] When my current phone no longer works, it will be time to add to my technology collection (or how to use 1% of what the device is actually capable of doing!).

In recent months, Bernie Ennis and Charlie Leonard have been working on the electronic details associated with making the ACC&CE a virtual organization. Right now, the entire enterprise seems like magic to me. The reality is that these men are now very close to being able "to go live" with all of our Council and Technical Meetings available via Go To Meeting.

I've been a willing test subject. When Bernie is working his magic, it's my cue to seal my lips and to do my talking elsewhere. He was able to broadcast my presentation at our April 2016 Council Meeting. In recent days, he and Charlie showed me how to project some of my firm's PowerPoint presentations through Go To Meeting. I'd been a participant in Go To Meeting teleconferences before, but not like what Bernie and Charlie had in mind. In short, they could actually see what was on my computer screen (even though they were hundreds of miles away).

It appears that this technology is practically idiot-proof (since I am able to use it!). Bernie sent out an e-mail with a specific link in it. A "Brave New World" opened up when I clicked on the link. As Bernie's and Charlie's confidence in this technology grows, more and more of what the ACC&CE does will be via these types of links.

As many of you know, I was honored as the Distinguished Alumni Lecturer at SUNY Binghamton in 2014. I am now a member of the university's advisory board. When I am in town, the current chemistry chair likes to have me meet with the current (graduate and undergraduate) students. In the recent past, advising these young scientists and engineers to move to New Jersey and for them to seek industrial employment in the Garden State was "a no-brainer."

(Continued on page 3)

## LETTER FROM THE PRESIDENT (Continued)

The industry is not what it was in New Jersey. Many professionally-oriented jobs are now found throughout this country and beyond our borders. The marvels that Bernie and Charlie are mastering means (more than anything else) that colleagues throughout this country and around the world can become more active participants in the ACC&CE. While the young people whom I mentor have grown up with this technology, people like me remain amazed by the power of this technology.

While I am justifiably proud of the brilliant young scientists and engineers coming through SUNY Binghamton, I am equally proud of the initiatives that Bernie and Charlie have taken to ensure the enduring sustainability of the ACC&CE. As we pass the baton to these creative young men and women, the ACC&CE has now established a platform that these bright young scientists and engineers can build upon in ways that, just a few short years ago, would have been unimaginable to me.

Bernie and Charlie have worked out the economics associated with their endeavors and the projection is favorable. I am pleased to get out of the way of professionals who know much more about something than I do! This technological triumph bodes well for the ACC&CE in its quest to move forward in the 21st Century. Thanks for reading!  
Sincerely,

David M. Manuta, Ph.D., FAIC; President, Manuta Chemical Consulting, Inc.

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# MESSAGE FROM THE EXECUTIVE DIRECTOR

**John C. Bonacci, Ph.D. P.E., U.S. Patent Agent (Certificate #821) and the Executive Director of ACC&CE**

**Newsletter as of 6-6-16  
FROM THE EXECUTIVE DIRECTOR  
By Dr. John C. Bonacci**

I appreciate all of the volunteer efforts and assistance and cooperation in delegating the various duties of the Executive Director office during the transition period. Meanwhile, we are continuing to accept checks at the office mail during the transition.

Thank you.

John Bonacci

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## Letter from the Editor (and immediate Past President)

**By Joseph V. Porcelli, (Certificate #906)**

First of all, it has been about 6 months since the last newsletter. My apologies. Life has been very busy and stressful for your editor. I will endeavor to get back on the schedule of three newsletters per year.

The organization is going through substantial changes, but I think they are for the better and we are on the right track. We have continued to move to a fully “virtual” volunteer organization. During this year we have had a number of Council meetings, mostly on-line, as you can learn about in Bernie Ennis’ article on page 5. Also, we were without a functioning Executive Director for a few months while John Bonacci went through some health issues. Various members have volunteered to help out with John’s duties, and we will endeavor to be more effective than ever as we move forward. You will hear more about these changes in the coming months.

We would like to have all of our members, no matter their locations, to fully participate in the planning and executing of the required tasks in the future, and we urge all to watch for notices of future on-line meetings and presentations. We will be evaluating various on-line tools for meetings and presentations, from voice-only conference calls to full video conferencing. Bernie and Charlie Leonard, our webmaster, have been spearheading this effort. We thank them for their generous use of their time and talents. We are receiving increasing number of inquiries from prospective clients and we are adding new members, so the future looks good. “Stay tuned”. Joe Porcelli, Editor

## Progress Report on Virtual Meetings for ACC&CE

**Bernie Ennis, P.E. —Certificate #860**

ACCCE has expanded its reach with membership all across the U.S.A. from its founding long ago in New York City. Association management has historically been centered in NYC and New Jersey with speakers at dinner meetings and USPS mail communication to Members. In 2014 ACCCE overhauled its web site and in 2015 developed a Virtual Meeting capability using GoToMeeting software. This modern platform has been perfected through Council Meetings and Speaker's Presentations at dinner meetings with Council members attending from anywhere via Internet.

ACCCE is now moving to become a Virtual Organization and eliminating the historical need for dinner meetings. President David Manuta will be leading meetings from his home base in Ohio; Council Meetings will be scheduled as necessary to conduct ACCCE business without being tied to dinner/speaker venues; Guest Speakers will be making their presentations and showing their PowerPoint slides from their laptop computers at their own convenient Internet locations.

Starting in September 2016 all Members may attend Council Meetings and attend Speaker's presentations in real time. Videos will be promptly posted on the ACCCE web site [www.chemconsult.org](http://www.chemconsult.org) for those who could not attend the Virtual Meetings.

All Members will receive Meeting Announcements by e-mail with simple instructions including a "link" to click to join our Virtual Meetings. Post-meeting emails will be sent to all Members with a link to the ACCCE web site for full videos.

So be on the lookout for these new ways to participate in your organization. Of course, all Members are now encouraged to come forth with interesting presentations about their respective consulting experiences or about topics in which they would have special interests and expertise.

Please, potential speakers, do not be intimidated as Charlie Leonard, [Charlie@cleonard.net](mailto:Charlie@cleonard.net) and Bernie Ennis, [ennis@egtgroup.com](mailto:ennis@egtgroup.com) will acquaint you with the GoToMeeting software and you would simply present from your laptop computer."

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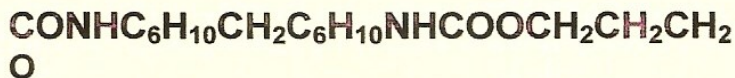
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## **A short story about the use of $^{29}\text{Si}$ NMR in an industry – academic partnership**

by Marvin B. De Tar, Ph.D., Managing Member, Molecular Technologies, LTD (Certificate #910)

The telephone call from the plant manager sounded desperate. Their closest customer told their head of quality assurance they were observing a sporadic problem that had recently started occurring. “What have you changed in your process?” The customer had taken the initiative to have the defect analyzed and had found two elements, the major one being silicon and the minor one a transition element at the site of the defect. The customer had called with the news and when the phone call ended the plant manager knew a solution to the problem needed to be elevated to a stay in business priority. The customer would reject entire pallets of product if the defect was found again. Also implied was if it wasn’t acted on immediately a relationship to develop a second supplier would be initiated on their part.

In our initial meeting about this problem it was agreed that every item that touched the manufacturing line would need to be examined immediately for the presence of silicon. However it quickly became obvious that the cost and time estimates on the analytical answers by elemental analytical procedures at a 10 ppm level would take a minimum of three weeks at a cost over \$4,000.00. Furthermore, an interruption in any of the production lines was not an answer either. A quick estimate of the demurrage charges and the consequence of shipping product to our customer at no cost to them until the analytical answer were found was estimated and would cost considerably more than \$40,000.00. Then a phone call from the already worried plant manager revealed the problem was worse than originally thought as the defective batch analysis revealed that several production lines were involved and were producing very similar sporadic defects.

The plant manager and the president of the company were assured that an answer would be forthcoming and could cost considerably less. For, as a result of working through several academic – industrial partnerships with University Research Foundations to find extra money for university departments with unique instrumentation, for helping pay for the ongoing upkeep of the instruments and for costs incurred in training graduate students in how to operate the instruments at the universities, other more rapid analytical solutions could be thrown at the problem. The company management was not aware of this approach.

[One of the uses of university instrumentation when performing industrial analyses is to allow students the opportunity to become familiar with how an efficient use of the instruments can cost effectively solve industrial problems. And it can be a great opportunity for manufacturing companies to reduce costs.]

Now the work started. A design of experiments was devised and a positive control at 10 ppm and negative control at zero ppm of silicon were prepared. It was determined that by employing 8 spectra acquisitions on each sample, the signal for the offending silicon material would be detected at greater than nine sigma.

## **A short story about the use of $^{29}\text{Si}$ NMR in an industry – academic partnership—Continued**

(Continued on page 8)

The plant manager was thorough with the samples provided, in total over a score of samples of different materials touching the product while on the production lines were received, more than expected. A call to the instrument manager at the University revealed that the solid state silicon NMR instrument could be readied in 14 hours to provide a slot for us to examine the samples. This was the best news and was recognized as quite a break because normally the instrument time is usually booked solid to three weeks out. The QA manager cut a check to the University Research Foundation for the expected total cost of the analysis. All but one of the samples could be tested by this approach.

All of the samples (except for the one that could not be tested because of its physical size), the design of experiments and the check were taken to the University. The instrument facility manager and graduate students were shown the experimental design, what data to collect, how many signal acquisitions per sample were to be collected, the email address of where to send the electronic versions of the results and an instruction that every sample should have a small quantity of their silicon reference standard present. The sample turnaround expected was about 20 - 30 minutes per sample.

The spectra were delivered electronically 38 hours later. The analysis set revealed that every sample examined had no detectable silicon except for the positive control sample. [Whew. If line broadening of the silicon spectra signal had not been recognizable, then the detection limit sample controls for determining the amount of the paramagnetic transition metal species and the set of positive samples would have had to have been run through an EPR instrument at a different University.]

Meanwhile, the parallel investigation of the only sample that could not be tested by the  $^{29}\text{Si}$  NMR method employed a different analytical approach. By using a microscopic Fourier transform infrared analysis technique, a variety of materials found on this part were examined and one was definitely loaded with the silicon contaminant.

So at 60 hours after the complaint had been received, the plant manager was sent a report indicating an inexpensive corrective action to be taken. And the engineering change order did not involve a change of any material composition touching the customer's product, another requirement imposed by the customer. And two truck trailers of product had been filled floor to ceiling and were ready for shipment.

The problem was finally resolved. It was discovered that one of the manufacturing plant's suppliers had been assured by their new, second supplier that their part was the same as a more expensive one their original supplier was making. Since they were no longer going to source from their original supplier, the plant manager was able to get the name of the original supplier and when they had switched to the second supplier. Everything fit the forensics analysis timeline.

## **A short story about the use of $^{29}\text{Si}$ NMR in an industry – academic partnership—Continued**

(Continued on page 9)

Replacement parts were immediately ordered, express delivered and installed on every line. A ½ mm difference in the critical dimension between the two parts made all the difference.

The customer was sent a full detailed report 72 hours after their complaint had been received. They were delighted and intrigued by the unexpected speed by which the answer had been forthcoming and the thoroughness that had been undertaken in arriving at an answer. The turn-around time was less than 10% of the time expected from using an elemental analysis approach and at less than 10% of the original anticipated cost. Best of all, the plant manager was delighted to get rid of a defect that was all of a sudden occurring sporadically on multiple production lines. The trucks were again rolling.

It was a delight to improve the good reputation the company already had with its customer. It is all about service, all about quickly drilling down to get the answer.

Molecular Technologies, LTD may be able to help with your difficult problem, too.

Marvin B. DeTar, Ph.D., Managing Member  
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