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Spectator

the Newsletter of the Ontario Section of SPE

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November 2015

Technical Presentation – Thursday December 10th
Novel Nanomaterial From Fishing Waste: Chitin Nanowhisker (CNW)
Presented by Aaron Guan

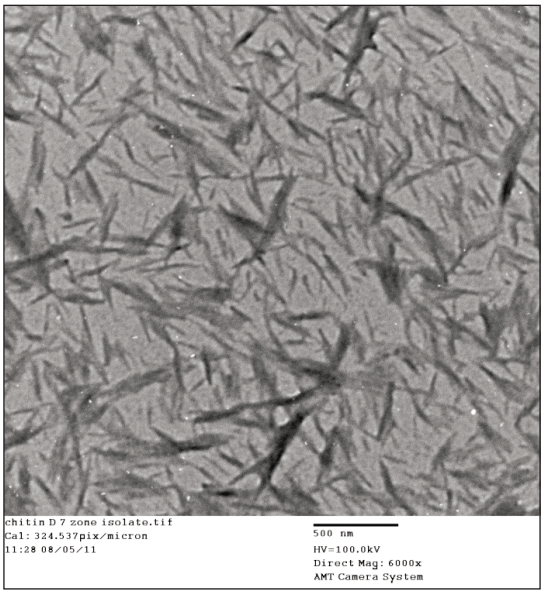
Location: Toronto Airport West Hotel, 5444 Dixie Road, Mississauga ON

Registration: 6:00 p.m **Dinner:** 6:30 pm **Presentation:** 7:00 pm

Price: Members $50, Guests $60, Students $30, Gotomeeting $25

(Limited spaces available for Gotomeeting – first come first served basis – sign/log in details will be sent to registrant) – Please register in advance online. Walk-ins – Add $10

Nature often presents us with unique and interesting materials that we tend to overlook. Not many have given the shells much thought when staring at that juicy lobster tail. However, BOCO Technology Inc. thinks differently. From it we were able to extract a material that weights as much as plastics but stronger than steel; a material with unique morphology and extremely high specific surface area that also imparts thixotropic properties; a single crystal that is largely impermeable to gaseous and liquid penetrants that is also biocompatible and biodegradable. Chitin nanowhisker (CNW) is a single crystal polysaccharide type material that exhibits all of those properties and more, but what does it mean for the plastics industry?



TEM Micrograph of Chitin Nanowhisker dispersion.

In this presentation, we will cover the implications of CNW on a number of polymer based applications; as direct mechanical reinforcement for thermoplastics including polyolefins and biobased polymers such as PLA and PHA; as reinforcement and nucleation agent for foams; as barrier property modifiers for packaging materials. We will also cover characterization of properties such as thermal, mechanical, rheological and morphological properties of CNW reinforced composites. Perhaps we could also share a few inside developments not exactly ready for the public yet.

Speaker Bio:

Aaron Guan is the founder, director and general manager of BOCO Technology Inc., a board director of SPE Thermoplastics and Foams Division. Received both his bachelor and master degrees in mechanical engineering at the University of Toronto, he has a number of publications in the fields of bio-based nano-reinforcement, biopolymers, thermoplastics and composites as well as several national awards. Founded BOCO in 2013, he currently specializes in the development of a novel nanomaterial known as chitin nanowhisker, a fishing waste sourced single crystal with flexible applications.

Coming Attractions this Year and Next

I hope all our members have had a great summer & Thanksgiving and taken full advantage of the good weather Mother Nature afforded us. The beautiful colours of fall have taken over in recent weeks, and we at the SPE Ontario have been putting together events for our members for the 2015-16 session that awaits us.

I wanted to begin by bringing you up to date with our website. In the past we have used http://www.speontario.com/, but we are transitioning to a SPE hosted page on the SPE main website as it is more efficient to maintain, as well as having greater mobile functionality, and can be accessed by other interested divisions and sections much more easily. The new address will be http://www.4spe.org/Communities/sectiondetail.aspx?ItemNumber=5378. This can be found by going to the SPE main website, then clicking on 'Communities', then 'Sections', then finally 'Ontario'.

The SPE Ontario information page will have our events listed and a paypal function for quick and easy payments. We apologize for any inconvenience caused during this transition.

We will endeavour to minimise any interruptions to your service. If you do have any issues as we move to the SPE hosted webpage please contact Bruce Howie (bhowie@dominioncolour.com)

Before I delve into the programme we have organized I wanted to thank everyone who attended our SPE golf event on 5th June. It was a very well received golf event, and we even managed to escape the rain that came later in the afternoon. I'd like to thank all our sponsors for their gracious donations. Without the support of our sponsors these types of events would be more difficult to organize, thankfully the Ontario plastics industry continues its strong support of the SPE at the local level. In terms of golf play, we had some fantastic scores with none better than the 62 scored by 'Alpha Team'. That's right 10 under par, which by any measure on a tight course

like Royal Ontario G.C. is a tremendous score. Well done on a fantastic effort by all concerned. We will of course be having another SPE golf event next summer on Friday 3rd June 2016, with a change in venue to Pipers Heath Golf Club, 5501 Trafalgar Rd, ON, L0P 1E0. Please contact our Golf Chair, Vijay Kudchadkar (Email: vk@compuplast.biz) for more information on costs, and how you can sponsor a hole, longest drive, closest to the pin, or lowest score.

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On December 10th we will be having an evening presentation from Aaron Guan, who is the founder, director and general manager of BOCO Technology Inc., a board director of SPE Thermoplastics and Foams Division. Aaron has been developing chitin nanowhiskers (CNW – a single crystal polysaccharide type material that is sustainably and economically extracted from crustacean shells) that will cover the implications of CNW on a number of polymer based applications; as direct mechanical reinforcement for thermoplastics including polyolefins and biobased polymers such as PLA and PHA; as reinforcement and nucleation agent for foams; as barrier property modifiers for packaging materials.

We are in the process of finalizing a plant tour for the beginning of 2016. Spaces will be limited, so we will advertise this as soon as we have verification. We will also be holding our 4th annual 'Careers in plastics' event alongside our student section. This gives post-grad students who have an interest in pursuing a career in the Plastics Industry the opportunity to present their findings via our poster presentation session, which is followed by a discussion focussed on some of the job opportunities in the current Canadian market, and a panel discussion aimed at providing advice to the students on how best to approach their job search and what skills employers are looking for.

We are in the act of organizing a Recycling Mini-Tec event for Spring where we will be joined by other industry bodies including C.P.I.A. This will be an event to educate and stimulate those who are both new and experienced with plastics recycling to illustrate the plastic materials that can be recycled, what the individual can do to assist our recycling efforts, and also look at post-consumer and post-industrial recycling. We will have presentations by various members of the recycling community, and there will also be a networking session.

I wish you all the very best for fall 2015, and we look forward to seeing you at our events this coming year.

Bruce Howie,
SPE Ontario President

SPEC-TECH-CLE

How Can Plastics Help Curb Food Waste?

Plastic packaging addresses people's hatred of waste

By American Chemistry Council (ACC)

Note: This article continues the series of updates in Plastics Engineering from Plastics Make it Possible®, an initiative sponsored by America's Plastics Makers® through the ACC. Printed with permission.

A previous article in *Plastics Engineering* (July/August 2015, p. 46) honored recipients of the 2015 DuPont Awards for Packaging Innovation, highlighting the contributions of award-winning plastic packaging to sustainability. Many of this year's winners exemplified the sustained efforts of those in the plastic packaging supply chain to diminish their environmental footprint.

The results of these efforts today can be measured in life-cycle studies that demonstrate that lightweight plastic packaging typically uses less material than alternatives, which results in less packaging waste and energy use and produces fewer greenhouse gas emissions. Studies today also find that packaging can be part of the solution for reducing food waste by helping prevent food spoilage and ensuring food quality and safety along the supply chain and at home.

Despite the critical role of modern plastic packaging in preventing both packaging waste and food waste, opinion surveys generally find that most Americans are unaware or skeptical of these contributions. So it's helpful to highlight these contributions – repeatedly, loudly, and compellingly.

To explore public opinions, earlier this year the firm TNS Global conducted a survey[1] of 1,000 adult Americans on attitudes toward food waste and packaging, on behalf of the ACC's Plastics Make it Possible initiative. The survey found that

The U.S. Department of Agriculture estimates that 30-40% of post-harvest food goes uneaten in the USA

76% of us say we throw away leftovers in our households at least once a month, while 53% throw away leftovers every week. And 51% of us say we throw away food we bought but never used.

And we apparently underestimate the value of all that that wasted food. Survey respondents estimated wasting $640 in household food each year. But U.S. government figures[2] are closer to $900 for an average household, and more than $1,500 for a family of four.

Just how much does this annual $900 worth of wasted food per U.S. household add up to? The U.S. EPA[3] says that as a nation the USA generated 37 million tons of food waste in 2013. The Department of Agriculture[4] estimates that 30-40% of post-harvest food – from farm to fork – goes uneaten in our nation. That's a massive amount of food, and it has an accompanying massive impact on the environment.

We Hate Waste

Wasted food today is the most prevalent material in landfills, according to the U.S. Environmental Protection Agency (EPA).[5] Decomposing food

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becomes a significant source of methane, a potent greenhouse gas. But its impact goes way beyond landfills and air emissions. As the EPA notes: "There are many resources needed to grow food, including water, fertilizers, pesticides, and energy. By wasting food, you are also wasting the resources that went into growing it."[6]

And researchers at Johns Hopkins University, who conducted a survey on similar topics, write:

"Because wasting food means wasting all the food's 'embodied'… environmental impacts, this loss contributes extensive water, air and soil contamination…."[7] Imagine all the time, energy, and resources involved in growing, protecting, delivering, preparing, and serving our food. Then imagine simply throwing away up to 40% of it, along with the accompanying impact on the environment.

The TNS Global survey found that we're not blithely cavalier about this waste. Seventy percent of us say we are bothered by the amount of food wasted in the USA. When asked what bugs us about it, 79% say it's the cost of wasted food, while 45% say we're bothered by others not having enough to eat. But what about concern over all that wasted food's impact on the environment? Well, only 15% of us make the link between food waste and its large impact on environment.

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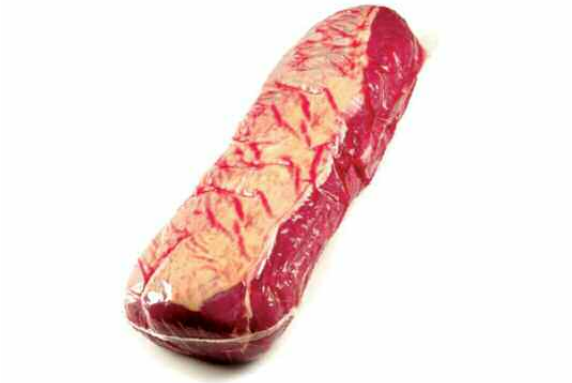
Regardless of where our concern lies – money, hunger, environmental impact – nearly all of us (96% according to the survey) say we should take one or more steps to prevent food waste, such as eating leftovers and avoiding over-buying perishables.

The Role of Packaging

Those of us in the packaging world understand that proper plastic (and other) packaging plays a huge role before and after we buy groceries. For example, packaging made with plastic helps prevent food waste by providing barriers to oxygen, light, temperatures, moisture, microbes, and other factors that lead to spoilage.



Plastic vacuum packaging for meat can result in 75% less food waste than store-wrapped meat.

In addition, it can contribute to important consumer benefits such as appearance, freshness, convenience, and portion control, which also can help reduce wasted food. And these advances keep coming, like plastic vacuum packaging for meat that can result in 75% less food waste than store-wrapped meat, active packaging that incorporates antimicrobials to help fend off spoilage, and plastic sensors under development that could monitor a food's actual freshness.

Beyond cutting down on wasted food, proper packaging is a wise investment because it can save all those wasted resources mentioned above. The Industry Council for Research on Packaging and the Environment calculates that "ten times more resources—materials, energy, water—are used to make and distribute food than are used to make the packaging to protect it."[8] So wasting food can squander ten times more resources than those used to make the packaging that protects it.

Given all the recent innovations in plastic (and other) packaging, such as those honored by the DuPont awards, using proper packaging has never been easier. But, among other results, the survey clearly uncovered a need for a broader understanding of the environmental impact of wasted food and the role that proper packaging plays in preventing it.

"Just a little bit of plastic packaging can prevent a whole lot of food waste," says Steve Russell, VP of plastics at the ACC. "Proper packaging is essential. This survey demonstrates that we must raise awareness of the negative impacts of wasted food and the positive role lightweight packaging can play in prevention. Improving the way we protect and preserve foods can help consumers save money, get more food to people who need it, and significantly reduce our environmental footprint."

References

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Small businesses spurring Canadian economy, but challenges lie ahead, report says

Canadian small businesses created a whopping 80 per cent of the country's new private-sector jobs over the past year, but they're headed for difficult times if they don't refocus their efforts on innovation and growing export markets, according to a new CIBC World Markets report.

"The small business sector has unequivocally kept Canada's economy from sinking into deeper water," said Benjamin Tal, CIBC deputy chief economist and co-author of the report. "While Canada's small and medium-sized enterprises (SMEs) have been an island of stability, not only demonstrating resiliency during the recession but also leading the way during the recovery, they are entering a new reality, one that will force them to innovate and enter new markets to sustain growth."

As the 2008-2009 financial crisis receded, Canadian entrepreneurs showed remarkable resilience in recovering lost ground, the study found, with the number of new companies having climbed 19 per cent since 2007. Meanwhile, large firms' growth fell almost three per cent over the same time period, according to the report.

"The secret behind this unprecedented ability of small business to overcome weak economic conditions over the past cycle is their exposure to Canadian consumers, who by opening their wallets, almost single-handedly moved Canada back into the growth column," Tal said.

The strength of Canada's housing market has insulated the country's small businesses as well, the CIBC report said, with SMEs employing close to 70 per cent of workers in the construction and real estate industries.

But an over-reliance on the Canadian market can be dangerous, "should the tide turn," the report warns. "With debt-to-income ratios just under 165 per cent and house prices looking stretched in many pockets of the country, consumers can't be relied on to provide the type of growth seen in the recent past. Canadians are just about maxed out on debt-fueled consumption," Tal said. "To maintain and build on the performance of the past cycle, SMEs will have to change their business models by both raising their propensity to export and increasing investment in research and development."

And while some new small businesses look to enter the export market, those already shipping products are starting from a position of strength, already having invested more on innovation than non-exporters.

"Given Canada's weak productivity track record of late, any support from SMEs will be a boon to the country," Tal said.

Sabic dissolving Innovative Plastics unit, relocating to Houston from Pittsfield, Mass.

Chemical supplier Saudi Basic Industries Corp. (Sabic) is dissolving its Sabic Innovative Plastics unit.

As part of the decision, Sabic is also closing its long-time office in Pittsfield, Mass., and moving to Houston – what the company calls "the heart of the U.S. petrochemical industry."

In a news release, officials with Riyadh, Saudi Arabia-based Sabic said that the company's commodity products will be placed in the parent firm's Chemicals and Polymers unit. Remaining Sabic IP products will be in a new Specialties unit.

Some of the 300 employees in Pittsfield will transfer to Sabic offices in the Houston area, officials said. The company is still evaluating Pittsfield's Polymer Processing Development Center and its location.

"Exiting the Pittsfield site was a logical yet very difficult business decision, knowing the important role our business and people have played in this community over the years," Sabic vice president and acting CEO Yousef Al-Benyan said in the release.

GE Plastics was based in Pittsfield for many years and the business remained there after being sold to Sabic for in 2007.

The Pittsfield HQ will be closed during 2016, the company said, with the majority of the relocation to Houston completed by midyear.