

# Hands on Chemistry Review



Issue 2, 2015

## Welcome to Hands on Chemistry Review

"Hands on Chemistry Review" is the newsletter of Digital Specialty Chemicals ("DSC"). DSC is a manufacturer of high quality chemicals that are in demand in the global pharmaceutical, specialty chemical and electronics markets. DSC offers materials in developmental to commercial quantities. In each issue we bring you company news, employee biographies, new and developmental product information, technical reports and notice of upcoming events. Any questions or suggestions you have regarding the newsletter should be directed to Arathi Mogudala on +1-(416) 231-2991x 141 or [marketing@digitalchem.ca](mailto:marketing@digitalchem.ca). To subscribe to the electronic newsletter please send your e-mail address to [marketing@digitalchem.ca](mailto:marketing@digitalchem.ca). Please also contact Arathi to obtain access to previous issues of Hands on Chemistry Review. We would be happy to interact with you on a more frequent basis: please see the links to our social media sites at the end of the newsletter.

## Upcoming Tradeshows & Conferences

We will be exhibiting at Chemspec Europe in Cologne, Germany 24<sup>th</sup>-25<sup>th</sup> June (booth #G01).

We are a proud sponsor of the Organic Process Research & Development Conference in Toronto, Canada 13<sup>th</sup>-15<sup>th</sup> July.

## DSC Receives Investment from Intel Capital

We are pleased to announce an equity investment from Intel Capital, Intel Corporation's global investment organisation.

"Since 1987, we have provided custom and high volume high purity chemicals to the semiconductor, pharmaceutical and specialty chemical markets worldwide. Our people, processes and facilities combine to offer the agility of a small, fine-chemical operation with the capacity of a large supplier," said Dr. Ravi R. Gukathasan, CEO. "We believe that the continuation of Moore's Law for semiconductor processing will depend greatly on continued innovation of advanced precursors which provides a growth opportunity for DSC. The funding from Intel Capital will help enable us to construct state-of-the-art R&D and

manufacturing facilities to meet growing demand for thin film technologies."

"Materials innovation is critical to enabling new capabilities in semiconductor device design and manufacturing," said Robert Bruck, corporate vice president and general manager of Global Supply Management at Intel. "We look forward to supporting DSC's growth including development of new materials technologies for advanced semiconductor manufacturing process technology nodes."

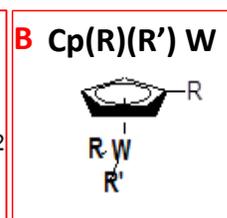
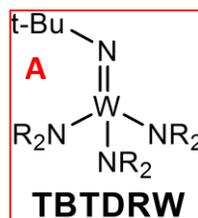
Our goal is to build a state-of-the-art research and development lab, pilot plant and manufacturing facility to deliver high quality material to our customers. Through this investment, we have completed the first phase of achieving this goal.

## Halide Free - Tungsten ALD Precursors scaling into pilot production

Author: Ravi Laxman, VP, Electroincs  
([Ravi.Laxman@digitalchem.com](mailto:Ravi.Laxman@digitalchem.com))

Thin films of Tungsten are metallic electrical conductors and are suitable in microelectronics as barriers to the diffusion of copper, electrodes, metal gates and contact plugs.

Halide free Tungsten precursors (without F and Cl) show promise for ALD W thin films. Hydrogen halides as side products during the ALD processes of transition metal, metal carbide, metal nitride on various surfaces, cause damage by halide contamination and subsequent uneven etch to the underlying layers, especially to silicon oxide, aluminum and copper.



Two Tungsten ALD precursors are manufactured in semiconductor grade that have excellent thermal stability. ALD

deposition is carried out using vapors of these precursors with ammonia, or hydrogen; A. Tungsten bis(tert-butylimide)-bis-(dialkylamide), a liquid precursor. B. New Cyclopentadienyl Tungsten, a solid precursor with high volatility at <50°C with



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very low residue (< 0.9%) by TGA. Both the precursors deposit thin films at temperatures from 250 to 350 °C. ALD processes produced pure tungsten and tungsten nitride films with high uniformity and excellent step coverage in holes with high aspect ratios.

### **DSC Barbeque at OPRD Conference – July 14, 2015**

**Author: Christine Harnett, VP, Business Development Pharma (cjharnett@digitalchem.com)**

DSC is excited to be participating as a sponsor and evening host during the upcoming Organic Process Research & Development (OPRD) conference organized and managed by Scientific Update and to be held from July 13 to 15 in Toronto, Canada. On the evening of Tuesday, July 14th, conference delegates are welcome to visit the company's headquarters for a facility tour, to meet DSC team members and join the people of DSC in partaking of a delicious barbeque.

Scientific Update based in Mayfield, East Sussex, UK, was established in 1989 by Dr. Trevor Laird as a premier training and educational service organization for industrial chemists and chemical engineers. Today, the company is managed by a team of experienced and knowledgeable chemistry leaders with Dr. Will Watson serving as Technical Director and Dr. Claire Francis serving as Director.

Scientific Update's offering is comprehensive ranging from organizing and running conferences, training classes and webinars to consultancy services. Scientific Update has a dedicated team of scientific consultants, with a wide range of experience, not only in the pharmaceutical industry but also in fine chemicals, color chemicals, agrochemicals and flavors and fragrances. The consultancy team provides a wealth of experience and has rigorously studied cutting edge trends.

The educational emphasis at Scientific Update is on chemical development and scale-up. The organization's training classes cover specialized topics in organic chemistry including courses on Heterogeneous Catalytic Hydrogenation, Secrets of Batch Process Scale-Up and The Design, Development and Scale-Up of Safe Chemical Processes and Operations. The short intensive training courses enable scientists to learn about highly relevant topics, to broaden their knowledge and to keep abreast of new science, new technology and new techniques. Many of the courses are available for in-house training at the clients' companies.

Scientific Update's conferences provide the perfect forum for organic process chemists and chemical engineers to network with experts from industry and academia from all over the world. Their most popular conference, OPRD,

attracts 80-120 senior chemists from all over the world to hear 16-20 industrial case studies on how people are addressing current process development issues.

This summer's OPRD conference in Toronto is set to be a thrilling opportunity to learn the latest leading edge approaches and techniques in process chemistry and development. The 3 day session will cover:

- Key speakers who will present detailed case studies.
- Ideas on how to design for efficiency and strategies to meet today's challenges.
- Important information on technical developments and future trends in pharmaceutical development.
- A Special ½ day Seminar Session on 'Cross-Coupling' sponsored by Umicore Precious Metals Chemistry.
- A Short Course on Green Chemistry being held by the IQ, the International Consortium for Innovation & Quality in Pharmaceutical Development.

The OPRD conference in Toronto is poised to be an excellent event for learning, networking and enjoyment. A fun-filled evening on Tuesday night, July 14th, is planned by DSC. Delegates will be picked up at the conference hotel, the Radisson Admiral, in downtown Toronto by comfortable mini-buses and brought to DSC on the eastern side of the city. DSC chemists, managers and other team members will be on hand to greet the delegates and small groups will be organized to tour DSC's fine chemicals production facility. The beautiful, adjacent garden will be available for strolling and relaxing, weather permitting. The evening will be capped by a bountiful BBQ and a playful dessert selection. For more information on the OPRD conference and DSC's event on July 14th, please contact Christine at cjharnett@digitalchem.com.

### **Employee Biography: Dila Donbosco, Controller**

Dila joined DSC in February 2015 as our Controller. She is responsible for corporate-wide financial management and reporting, including all aspects of financial reporting and planning, investor relations and cash management.

Prior to joining DSC, Dila spent 6 years at a mid-size accounting firm in various areas of public practice from audit and



assurance to business and tax advisory. She holds a Bachelor of Business Administration degree from the University of Toronto and is a member of the Chartered Professional Accountants of Ontario.

## Community Involvement

### Art from the Heart

We have added another beautiful piece of artwork to the foyer of our facility in Toronto. DSC commissioned **David Ruben Piqtoukun** to sculpt a 63ft Blue Fin whale jawbone. The whale was harvested on May 25<sup>th</sup>, 1967 in Trinity Bay, Newfoundland. According to the artist the sculpture represents INUIT mythology. Some of the images carved include a “one-eyed Shaman” who steals the moon to prove himself to the people who did not believe he was able to do so, Sedna the sea goddess, fish, flying whales of Alaska, polar bear prints and other images from INUIT legends and mythology. The sculpture was given the title “Perpetual Search” as the artist sought out to illustrate the perpetual search for food and hunting areas by the INUIT. The stone base of the sculpture contains chemical symbols which the artist used to represent the scientific industry’s perpetual search to mine resources that can be utilized for innovation. Our CEO has commissioned the artist to sculpt another whale bone which is to illustrate the impact the chemical creations have had on mother earth

### Pot Luck Lunch Recipe

The pot luck lunch (this is a lunch where all the participants bring one dish and everybody shares the food) is a regular part of our social program. Below is a recipe from Vasanti Baker, QA Assistant, and Manufacturing Support, who took the prize for favourite dish at our March lunch. We hope you enjoy her delicious meatloaf as much we did!

#### Meatloaf Ingredients:

- 1 pound of ground beef
- 1 pound of ground pork
- 4to 5 Onions (chopped)
- 6 eggs
- Garlic (Fresh or garlic powder)
- 1 packet of bacon (optional)
- 1 to 2 cups of bread crumbs
- 1 teaspoon Worcestershire sauce
- 1 packet of mixed frozen vegetables
- Parsely, Basil, Rosemary (optional)
- Salt and Pepper
- Ketchup, brown sugar, milk

#### Directions

1. Preheat the oven to 350 degrees.
2. Boil 4 eggs (until almost fully boiled) and peel off



shell

3. Put all the frozen vegetables in a blender and blend it.
4. In a large bowl, combine the beef, pork, mixed vegetables, 2 eggs, onions, garlic, Worcestershire sauce, a bit of milk, salt and pepper, parsley, basil and rosemary. (you can fry some bacon and add it as well with the bacon fat) and mix well
5. Carefully put the boiled egg in the middle of the mixed meat and roll it.
6. In a separate small bowl, combine the brown sugar, ketchup and Worcestershire sauce. Mix well and pour over the meatloaf.
7. Wrap the meatloaf with the bacon and bake at 350 degrees for 1 hour or until it is cooked.

**Bona Appétit!!**

This year's Digital Specialty Chemicals Graduate Scholarship went to **Samantha Smith** from the University of Toronto, Chemistry Department.

#### **Contact Information**

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