Perspectives of Careers in the Chemical Industry

Dr. Christoph Krumm
Sironix Renewables
Co-Founder & CEO

Linda Sedlewicz
schulke inc.
President & CEO

Maureen Kavanagh
3M
Senior Technical Manager
Welcome to the Green Chemistry Commitment
Green Chemistry Education Webinar Series
*presented jointly with the GC3*

- Submit questions at any time during the webinar!
- Recording and supporting documents will be available: [http://www.beyondbenign.org/he-webinars/](http://www.beyondbenign.org/he-webinars/)
Join the conversation!

@beyondbenign
@The_GC3    #greenchemistry

https://www.facebook.com/beyond.benign.green.chemistry.education/

https://www.facebook.com/GreenChemistryAndCommerceCouncil/

Thanks for joining!
The Green Chemistry Commitment’s

Green Chemistry Education Webinar Series

What is the Green Chemistry Commitment?

- A consortium program aimed at uniting the green chemistry community to:
  - expand the community of green chemists
  - grow departmental resources
  - improve connections to industry and job opportunities in green chemistry
  - affect systemic and lasting change in chemistry education
- Voluntary, flexible program for adopting green chemistry student learning objectives
- A program for recognizing the work that your institution is currently doing in green chemistry

http://www.beyondbenign.org/he-green-chemistry-commitment/
Derrick_Ward@beyondbenign.org
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Perspectives of Careers in Chemical Industry
Christoph Krumm, April 30, 2018
About Me

Christoph Krumm
CEO, Co-Founder
Sironix Renewables

Education:
B.S. Chemical Engineering, University of Washington
Ph.D. Chemical Engineering, University of Minnesota

Intro to Entrepreneurship:
• Coursework to develop startup idea
• Accelerator programs to refine concept
• Grant funding to launch startup
• Competitions & partnerships to grow
Technology Development

Grad School:
2011-2015: Biofuels research
2015-2016: Renewable chemical technology

Can we make existing petrochemical surfactants from renewable sources?

Linear Alkylbenzene Sulfonate (LAS)

Petrochemical

Agriculture & Agrochemicals

Personal Care & Cosmetics

Detergents & Cleaners

Oil Recovery

Paints, Inks, & Coatings

SIRONIX RENEWABLES
Technology Development

- Petrochemical
- Oleofuran Surfactant (OFS)
- Linear Alkylbenzene Sulfonate (LAS)

Ca^{2+} [ppm] 30 230 10,000

LAS

OFS-12

ACS Central Science, 2016
Starting up Sironix Renewables

<table>
<thead>
<tr>
<th>Year</th>
<th>Activities</th>
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<tbody>
<tr>
<td>2016</td>
<td>Conceived Technology, Filed Patents</td>
</tr>
<tr>
<td>Spring 2016</td>
<td>Startup Coursework:&lt;br&gt;• Learn from potential customers in your space&lt;br&gt;• Understand the ‘ecosystem’ of your market space.</td>
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<tr>
<td>Late 2016</td>
<td>Innovation Accelerator: developed business concept&lt;br&gt;• Who is going to buy your product?&lt;br&gt;• What are their problems and how can you solve them?&lt;br&gt;• Why pursue this as a startup company?</td>
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Starting up Sironix Renewables

Applied for SBIR Grants (Small Business Innovation in Research)
- Fund company to demonstrate proof of concept & scale technology
- Excellent for translating academic research to company
- Earned 3 grants totaling to $1.3M

2016-2017

2017-2018

Applied for partnership grants
- Fund specific aspects of technical development (e.g. one reaction step, scale up)
- Bring in outside expertise without needing to hire
Sustainability & Startups

Build a business case around your idea:
• Sustainable innovations should improve upon what exists
• Learn and try as much as you can up front, “fail often and fail early”
• Be open to change and ask questions

Think about the business side early on:
• Research project: what is the impact? Who would use this?
• Talk to people!

Sustainability & Startups are the perfect match
Linda B Sedlewicz
schülke inc.
President / CEO
In the beginning...

- My ethic / my dad
  - Don’t be afraid to start from the bottom and work your way up
  - Understand the depth and breath of your subject

- High School years
  - Science & math nerd
  - Favorite hobby - cooking
College

- Cook College, Rutgers University, New Brunswick, NJ
  - Entered college as a Pre-Vet major
  - Changed to Economics major
  - Focus on Accounting & Marketing
  - Graduated BS in Economics

- Summer job
  - Quality Control Lab Technician, Enco Products, Division of American Hoechst
Career

- Oakite Products
  - Financial Analyst
  - Key learning
    - ✓ I was happier in a lab

- JB Williams Company
  - Lab Technician → Junior Chemist R&D Personal Care
  - Key learnings
    - ✓ Chemistry is cooking
    - ✓ Accept help and advice from those around you
    - ✓ Take additional classes to make yourself more valuable
Van Dyk & Company
- Junior Chemist → Chemist Applications Laboratory
- Key learning
  ✓ Continuing Education courses give “real world” training
  ✓ I wanted more human contact

Sutton Laboratories / ISP
- Technical Sales Representative → Marketing Manager
- Key learnings
  ✓ Knowing what your customers do makes you a valued resource – increases sales
  ✓ Puzzles are fun!
  ✓ The value of a mentor
Career

- Gattefossé Corporation
  - Marketing Manager ➔ Technical Sales Representative
  - Key learning
    ✓ Industry is looking for EFFECTIVE natural products
    ✓ There is no shame in taking a step backward, if it helps to move you forward

- schülke inc.
  - President / CEO
  - Key learnings
    ✓ Mentors are extremely useful
    ✓ Keep learning new skills
    ✓ All learning is valuable
It is all “Green Chemistry” if you want it to be!

Most industries are looking for natural/sustainable alternatives
  - Personal care
  - Fuel, Oil & Gas
  - Automotive
  - ....

Many companies have teams/departments focusing on sustainability
How is any of this “Green Chemistry”

- Fastest growing segment of the Personal Care Industry is “Natural/Green”
- Raw material suppliers are investing in Green Chemistry R&D
- Sustainable production
  - “Cradle-to-grave”
  - “Cradle-to-cradle”
- Most industries are going “green” where they can
Tips for success

- Don’t be afraid to get you hands dirty
  - Starting at the bottom gives you a depth and breath of hands-on understanding that books can’t
- Follow your interests
  - You will be happier and more productive
- Grow with your interests
  - Don’t be afraid to reinvent yourself occasionally
- Accept help from others
  - You can learn a lot from those around you
  - A good mentor is extremely valuable
Thank you for your attention!

Linda B. Sedlewicz
President / CEO schülke inc.
linda.sedlewicz@schuelke.com
Green Chemistry Careers in Industry

Maureen Kavanagh
Sr. Technical Manager
Our Vision
3M Technology Advancing Every Company
3M Products Enhancing Every Home
3M Innovation Improving Every Life

Who We Are
Improving lives since 1902.

- 15% culture
- 89+ thousand
- nearly 1.5 billion
- 16x
- 300+ thousand
- 2.1 million
- 10 feet
- 200+
Global Challenges

Raw Materials  Energy & Climate  Water
Health & Safety  Education & Development
Education and Accomplishments

Education

- University of Wisconsin – River Falls
  Bachelor of Science in Chemistry
- College of St. Scholastica
  Master of Arts in Management

Accomplishments

28 Patents
immune response modifiers, renewable materials and pressure sensitive adhesives

1 Certification
Building and Leading Effective Teams: Executive Education Program with Columbia Business School and ExecOnline
Professional

Professional Experience

3M
Industrial Mineral Products Division, Sr Technical Manager
Pharmaceuticals, Documentation Analyst, Research Chemist

Knox Lumber Company
Inside Sales

Professional Evolvement

Center for Sustainable Polymers - University of Minnesota

Green Chemistry & Commerce Council (GC3)

Founding Member and Past Chair of 3M’s Green Chemistry Chapter
Sustainability
Passion to Drive Technology for the Future

3M™ Cool Roofing Granules help roofs reflect heat, decreasing the effects of urban heat islands while still being affordable.

Made with 67% plant-based adhesive
Education, Professional and Sustainability

Education

- University of Wisconsin – River Falls
  Bachelor of Science, Chemistry
- College of St. Scholastica
  Master of Arts in Management

Accomplishments

- 28 Patents
  immune response modifiers, renewable materials and pressure sensitive adhesives
- 1 Certification
  Building and Leading Effective Teams: Executive Education Program with Columbia Business School and ExecOnline

Professional Experience

- Sr. Technical Manager
- R&D Technical Manager
- R&D Technical Supervisor
- Sr. Research Chemist
- Documentation Analyst
- Research Chemist
- Technical Aide
- Inside Sales

Professional Evolvement

- Center for Sustainable Polymers
- University of Minnesota
- Green Chemistry & Commerce Council (GC3)
- Founding Member and Past Chair of 3M’s Green Chemistry Chapter

Sustainability

Passion to Drive Technology for the Future

3M™ Cool Roofing Granules help roofs reflect heat, decreasing the effects of urban heat islands while still being affordable.

Made with 67% plant-based adhesive
Tips

- Be Passionate about what you are doing...
- Become an Expert!
- Communication
- On the job training!
- Training
- Education
- Network
- Professional Experience
- Sustainable Experience
- Coaching
- Engaged Employee are successful
- Success is different for every person

Education

Continue to educate yourself

3M
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Thank you! QUESTIONS?

Recordings, supporting documents and upcoming webinars (with registration links): http://www.beyondbenign.org/he-webinars/

Sign-up for our quarterly newsletter and webinar announcements on our homepage: www.beyondbenign.org