Battelle – Response to Questionnaire

Presidential Green Chemistry Award 2008 Greener Synthetic Pathways Award

These answers are from Jeff Caffmeyer, who was a member of the team that developed the biobased toners. Caffmeyer is currently a Senior Research Scientist who works in process at project development at Battelle.

**What has your development of this technology meant to your company?**

Battelle is a contract research organization meaning that we perform research on behalf of others.  We focus on the innovation and discovery aspects of developing a technology and then look to commercial entities to bring it to the marketplace.  In that sense, we are happy and excited to be able to develop new and useful technologies that other companies can be successful with in terms of sales and revenue.  Battelle sells or licenses the technology and that is often the end of our engagement with it.  In this particular case, we have had a robust research effort in biobased products and biobased toners has been a highlight and a prominent example of innovation which we are able to share with our prospective customers.  In case you do not know of the history of Battelle, we were responsible for converting Chester Carlson’s proof of principle concept for “dry writing” into an electrophotography or xeroxgraphy device (better known as a photocopier and commercialized by the Haloid company which ultimately became Xerox).  Photocopier and laser printer toners from biobased feedstocks are essentially the latest incarnation of a technology which we developed.

**       When you began working on this technology, what were your motivating factors and was green chemistry or green engineering a part of your mindset?**

As mentioned, Battelle has been very active in biobased product research and development.  A lead sponsor of this work over the last 18 years at Battelle has been the Ohio Soybean Council which is a farmer-run organization which promotes the use of soybeans.  They have funded research into creating new industrial uses for soybean components namely the oil and protein derived from them.  So our primary motivating factor was to create a value-added product from soybeans for our client, Ohio soybean farmers.  The original concept embodied several of the green chemistry principles such as using sustainable/renewable feedstocks, designing products which degrade after use, increasing energy efficiency, and preventing waste.  Our primary motivation was the use of soybeans in some aspect and we felt we would be able to differentiate the technology by making it more functional by designing in better “de-inkability” or recyclability.  In the end our licensee has made the recyclability less of a focus due to practicality, but the sustainability was sufficient especially for the recycled/remanufactured cartridge market.

       **Has developing this technology or winning this award influenced your professional outlook, personal goals, or definition of success?**

I’m not sure that I would say that there is any specific influence.  It definitely hasn’t make the job easier.  The expectations are high that one can simply continue to produce the next successful technology and win the next award having done it before rather than recognizing that a lot of things went right for this to have worked out the way that it did.  Overall, I appreciate that the successes have overcome a wide range of obstacles and not all being of the technical variety.

       **What has being awarded the PGCC Award meant to your company and how has it influenced your career?**

As I alluded to in the first answer, I feel privileged to have worked on a project which was successful and recognized with the award.  It is relatively exclusive company to have done so and we readily use this as an example of our ability to innovate and provide meaningful solutions.  That being said, we continue to look for the next opportunity.

**       Are there any professional experiences related to green chemistry or green engineering that you would like to share?**

To me, green chemistry and engineering speaks to efficiency which I think is the goal for all chemistry and engineering: to have a simple and economical solution.  I’ll digress a bit and discuss biobased products in particular.  At present the industry as a whole seems currently focused on providing biobased/renewable/sustainable/green replacements for existing petrochemical products with the same function or performance (i.e., replacing what we know).  In that model, the evaluation is based on cost and performance where the expectation is that it will be the same or better performance for generally the same or less cost.  Biobased or green products can typically be a tie breaker in selecting the biobased option.  I think in the future we will focus more on what new features biobased products can bring and that will be exciting time and opportunity to explore the new benefits of those products.  And some of those new features will be designed into the products when they are created in plants or micro-organism as the chemical factory.

**       Do you have any advice for a young chemical engineer beginning my career in industry?**

I have always felt fortunate to be able to work in a situation which I find interesting and challenging on a daily basis.  I think a successful career begins there.  In my case, I would also say that having good fundamental skills and the ability to apply them to more specific and complex issues has been better than deep specialization in any one field of study.  While it sounds cliché, I recommend that you have a strong foundation, like (if not love) what you do, and success will be borne out by determination, persistence and some luck.