Editorial

MONICA SHAW | EDITORIAL DIRECTOR
mshaw@tappi.org

Innovative oxygen delignification: Conversations with the *TAPPI Journal* 2012 Best Research Paper Award-winning authors

Editor's Note: *TAPPI and the* TAPPI Journal *(*TJ*) editorial board congratulate the recipients of the 2012* TAPPI Journal *Best Research Paper Award, Dr. Adriaan van Heiningen, professor in the University of Maine's Department of Chemical and Biological Engineering, and Dr. Yun Ji, who received her Ph.D. from the University of Maine and is currently assistant professor at the University of North Dakota. Their research, "**Southern pine oxygen delignified pulps produced in a Berty throughflow reactor: How to obtain the highest degree of delignification while maintaining pulp yield and quality**," was decided by* TJ *editorial board members as the award winning paper for 2012. It appeared in the March 2012 Special Pulp Bleaching issue featuring papers from the 2011 International Pulp Bleaching Conference. Organizers of this special issue were Brian N. Brogdon and Peter Hart of the* TJ *editorial board, who solicited these papers and saw them through* TJ*'s peer-review process.*

In this column, TJ *speaks with Drs. Van Heiningen and Ji about the significance of this paper, ongoing research, and potential commercial application.*

– **Monica Shaw**, Editorial Director

Conversation with Dr. Adriaan van Heiningen, professor, University of Maine

How did your research on this particular study of oxygen delignification come about?

Dr. van Heiningen: Oxygen delignification is an environmentally friendly technology that could increase the degree of delignification beyond current limits. Presently, it is difficult attain a high degree of delignification, because we must stop at 50% or 60% to preserve strength and physical properties of the fibers. By employing a Berty throughflow reactor as was done in my co-author's (and former student's) dissertation study at the University of Maine, we showed that it is possible to attain a higher degree of delignification by using this unique kinetic method to better study delignification rate.

How did you decide to use the Berty reactor when this application was outside its typical use?

Dr. van Heiningen: I was familiar with kinetic studies used in the petrochemical industry where they test the kinetics of different reactions with catalysts in the basket of a Berty reactor. We had the idea to use the same system, but instead of having a catalyst in the basket, we put the kraft pulp in there to better follow the kinetics, because we could keep all operating conditions constant.

With batch reactors, the caustic concentration or the oxygen concentration, for example, can change. With the Berty reactor, we could keep the hydroxide (caustic) low and uniform because we could continuously resupply it, allowing us to achieve many more degrees of delignification than is possible using a batch reactor. This opens possibilities similar to what we have in kraft cooking by injecting white liquor at different locations. By manipulating the concentration profile of alkali in the reactor, we can perhaps do a similar thing to improve oxygen delignification.