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Addressing nanocellulose commercialization needs: R&D collaboration is vital

This special edition of *TAPPI Journal* presents demonstrable progress toward the goal of commercial-scale implementation of nanocellulose. Steve Winter of International Paper and I, as co-leads of the Cellulosic Nanomaterials team of the Alliance for Pulp & Paper Technology Innovation (APPTI), see this widespread engagement of the research community in developing innovations as critical to successful commercialization. Congratulations and thanks to TAPPI and to the researchers publishing in this issue and elsewhere.

Technical barriers to commercialization

Dewatering, or concentrating, nanocellulose slurries for more efficient shipping or use in water-limited applications is inherently difficult because of the high water-holding capacity and high viscosity of these materials at low concentrations. Furthermore, many applications, such as plastics reinforcement, require a completely dry nanocellulose product that maintains the particles' nanoscale morphology. Preventing irreversible agglomeration of high surface area cellulosic materials during drying is challenging due to formation of strong hydrogen bonds between particles. New technologies are needed for scalable, economical pres-

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ervation of discrete nanocellulose particle morphology during drying for effective low-energy re-dispersion in aqueous systems and hydrophobic plastic resins.

Industry initiatives yield promising results

TAPPI initiatives have been instrumental in creation of the international nanocellulose community and broad dissemination of research results. Since 2006, TAPPI has held increasingly well-attended global conferences on renewable nanotechnology, including nanocellulose. This year's 2019 International Conference on Nanotechnology for Renewable Materials is predicted to attract the largest attendance since inception. The conference will be held in Chiba, Japan, June 3-7. Registration is open on the TAPPI website: <http://conference.tappinano.org/register/>.

Our APPTI team's mission is to overcome the pre-competitive knowledge gaps impeding more rapid commercialization of nanocellulose, and on building a tighter, broader network of U.S. collaborators. To that end, in Spring 2019 we will release two state-of-science reviews commissioned by APPTI and its partners that synthesize knowledge on two issues critical to commercialization—drying and dewatering, and compatibilization with plastics.

These two reviews from APPTI and partners and two other important documents—the 2014 United States Forest Service and National Nanotechnology Initiative report on Nanocellulose Commercialization ([FS-NNI Nanocellulose Commercialization Report, 2014](#)) and the 2016 APPTI Cellulosic Material Research Roadmap ([APPTI Technology Roadmaps](#))—provide a foundation for the upcoming workshop “Advancing Commercialization of Nanocellulose: Critical Challenges Workshop—Drying and Compatibilization,” to be held May 7-8, 2019, in Washington, DC. APPTI will host the event in collaboration with the U.S.D.A. Forest Service and the National Nanotechnology

Coordinating Office. The two-day workshop supports the U.S. Sustainable Nanomanufacturing Signature Initiative and will showcase U.S. capabilities and expertise in this promising field. We will review progress in closing critical research gaps related to plastics compatibilization and drying and dewatering, identify research projects to address remaining technology needs, and form interdisciplinary teams to execute them. Invited participants include Federal agency representatives, academic and institutional researchers, nanocellulose producers and suppliers, end-users, plastics compounders, equipment suppliers, and other interested parties. For more information and registration visit www.appti.org/2019-workshop.html.

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Looking for the best insights into Nano-Lignocellulose?

TAPPI's International Conference on Nanotechnology for Renewable Materials

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Two sessions/Eight presentations devoted exclusively to the science and technology of Nano-Lignocellulose:

- **Session 24:** Non-Traditional Methods for Nano-Lignocellulose Extraction
- **Session 25:** Lignin and Hemicelluloses Nanoparticles and Applications



Co-located with the Nanocellulose Forum's (NCF) Nanocellulose Exhibition in TAPPI



There is still time register and save! Early bird registration ends 1 May 2019.
Conference.tappinano.org/register