Pure Metal Films from Printable Metal-Complex Inks

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12:30 pm EST
Manufacturing Related Disciplines Complex (MRDC), Room 4211

Abstract: At Electroninks, we develop and manufacture advanced materials based on our particle-free conductive inks. Particle-free conductive inks are a relatively new platform of conductive inks, utilizing semiconductor chemistry in a printed electronics environment. Beyond silver, Electroninks has also developed higher temperature particle-free metal complex inks based on Gold, Platinum, and Nickel. These materials are printed by conventional means and exhibit 10 – 60% conductivity of the bulk metal. Particle-free metal-complex inks based on Silver, Gold, Platinum and alloys are used to form conductive traces, interconnects and electrodes on flexible substrates, advanced packaging architectures, as well as embedded into textiles to enable additive and streamlined manufacturing of electronic devices. A review of this technology and its broader impacts on metalization will also be presented.

Bio: Dr. Melbs LeMieux is an expert on thin films and nanomaterials, including thin film materials science, with emphasis in polymeric, composite, electronic materials, and conductive ink formulations. Dr. LeMieux is also active in technology commercialization and has a strong interest in enabling the development and realization of technologies and products incorporating advanced materials for the consumer electronics and medical industries. His background includes direct experience in product and technology development in applications related to display and printed electronics. In 2010 while a postdoctoral fellow at Stanford, he cofounded C3Nano, Inc., developing solution processed transparent electrodes for display and touch panel devices. From 2010 – 2014, he helped guide the company in winning the MIT Clean Energy Prize, as well as over $50M in fundraising. He went on to cofound Electroninks, Inc., which develops materials for consumer electronics, as well as its own consumer product line sold into international educational markets, CircuitScribe. Melbs received his Ph.D. (with honors) in materials science and engineering from Iowa State University, with emphasis on polymer physics and interfaces, under

the mentorship of Prof. Vladimir Tsukruk. From there, he was awarded an IC Postdoctoral Fellowship at Stanford University in Chemical Engineering where we developed low profile organic flexible electronic devices. His areas of research included organic electronics, carbon nanotube enabled electronics, carbon nanotube sensors, and flexible and transparent electronic materials. Melbs has co-authored over 40 publications and has been issued several patents.

Workshops for Students

Electroninks, Inc: Key Materials and Trends for Advanced Electronics
Friday, 04/01, at 10:00 am in MRDC 4211
Melbs is cofoudner of Electroninks, Inc. Electroninks Incorporated was founded in 2014, with market and technology launch around 2017. We are a company with a deep knowledge base in materials science, chemistry and design focused on providing materials, inks and products for consumer electronics devices, including our own consumer products.
Our novel chemistries and formulation know-how is based on our brand of metal-complex based particle-free inks and pastes that can directly replace nanoparticle and flake-based metallic inks and films. Our philosophy is that pure metallic films are the best way to increase performance, reliability and overall cost of manufacturing and ownership. To date, our products include conductive inks based on Ag, Au, Pt, Pd, Ni, and Cu metal-complex chemistry.

Since its founding, Electroninks has been adopted into the consumer electronics supply chain and developed its own entire consumer product line, Circuit Scribe. Currently, Electroninks develops high-performance solutions for many markets including display, plating, interconnects and wearables, as well as consumer devices.

Electroninks' headquarters and primary production facility is in Austin, Texas. We have additional sales and field offices in Silicon Valley, Taipei, Kaohsiung and Seoul. In total, Electroninks employs ~40 employees worldwide, with the majority of those in Austin HQ, with high-value roles. We are proud to manufacture in the USA, and have become a key domestic supplier, and in some cases sole-supplier, of these types of conductive inks.

How to Value Your Breakthrough: Entreprenneurship, TMT, and (or) Strategic Management in Technology Ventures
Friday, 04/01, at 2:30 pm in MRDC 4211
TMT Assessment, Strategic management, risk mitigation topics to help understand technology, and its true value. This includes IP assessment, market analysis, competive landscape, time to revenue, financing, and team building. The ultimate objective of this workship is to begin to prepare students for careers in innovation, entrepreneurship, industry, and product/patent portfolio management related to advanced materials topics. This will be addressed by providing students exposure and understanding to key materials/manufacturing issues and topics impacting important commercial technologies. Come by the workshop to learn how to develop a company's mission, product, getting started, and more! There will also be open discussion/Q&A time to talk about your own career – what should you do next and are you even prepared?