

Batteries—quick coatings

April 3 2017, by Kim Askey



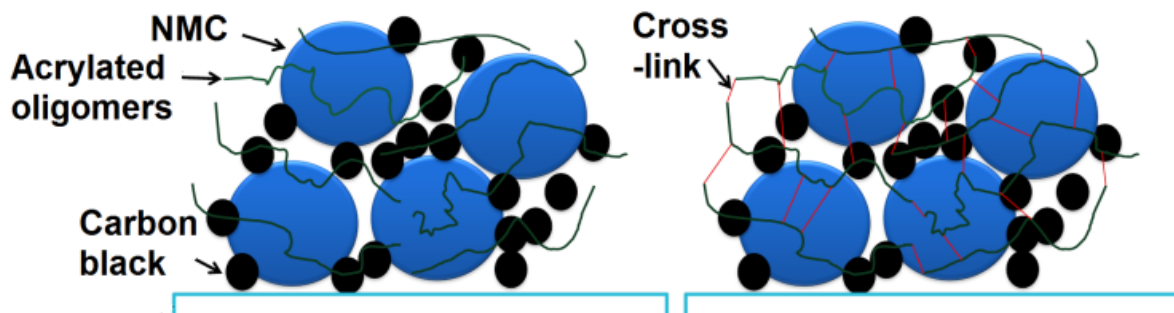
ORNL's Chris Janke (left) works with Stan Howell of ebeam Technologies USA to prepare material samples for electron beam curing, which instantly cross-links the binding resins in coating material at a high line speed of 500 feet per minute. Credit: Oak Ridge National Laboratory

Scientists at Oak Ridge National Laboratory are using the precision of an electron beam to instantly adhere cathode coatings for lithium-ion batteries—a leap in efficiency that saves energy, reduces production and capital costs, and eliminates the use of toxic solvents.

The technique uses an [electron beam](#) to cure coating material as it rolls down the production line, creating instantaneous cross-links between molecules that bind the coating to a foil substrate, without the need for solvents, in less than a second.

"Typical curing processes can require drying machinery the length of a football field and expensive equipment for solvent recovery," said ORNL's David Wood. "This approach presents a promising avenue for fast, energy-efficient manufacturing of high-performance, low-cost lithium-ion batteries."

Details of the [coating](#) technique were published in the *Journal of The Electrochemical Society*.



This illustration shows cathode material before and after electron beam curing, which creates cross-links among the molecules and binds them to the foil substrate in less than a second. Credit: ORNL's Zhijia Du.

Provided by Oak Ridge National Laboratory

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